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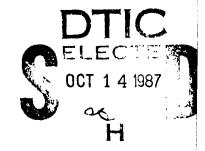


STATIC FORCE AND MOMENT TEST OF THE HOLLOMAN NARROW-GAGE ROCKET SLED AT MACH NUMBERS FROM 3.5 TO 5.5

> C. L. Ratliff Calspan Corporation

September 1987 Final Report for Period May 4 - May 7, 1987

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Approved for publication:

FOR THE COMMANDER

Dir, Aerospace Flt Dyn Test

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NOMENCLATURE

•	NUMENCLATURE
A	Projected frontal area of model, 8.289 in.2
AB	Cross-sectional area at the base, 7.514 in.2
ALPHA	Model angle of attack, deg
ALPHA-GP	Ground plane angle of attack, deg
ALPI	Indicated sector pitch angle, deg
CA	Forebody axial-force coefficient, (CAT - CABT)
CABT	Base axial-force coefficient, - CPBA · AB/A
CAT	Total axial-force coefficient, total axial force/QA
CLL	Rolling-moment coefficient, rolling-moment/ $QA\ell3$
CLM	Pitching-moment coefficient, pitching-moment/ $QA\ell_1$
CLN	Yawing-moment coefficient, yawing-moment/ $QA\ell 2$
CN	Normal-force coefficient,_normal-force/QA
CODE	Model configuration number (see Table 1)
CONFIG	Model configuration designation (see Table 1)
СРВА	Model base pressure coefficient, (PBA-P)/Q
CÁ	Side-force coefficient, side-force/QA
D S .	Horizontal distance between the centerline of the front and rear slipper, 9.6 in.
FOUL	Indicates which slipper(s) contacted the rail
HF	Average forward slipper height, in.
HR	Average rear slipper height, in.
hfi	Front slipper height forward of the centerline of each slipper, $i = 1, 2, 3, 4$
hri	Rear slipper height aft of the centerline of each slipper, $i = 1, 2, 3, 4$
1;	Reference lengths to calculate the pitching-moment, yawing-moment and rolling-moment, in. $i = 1, 2, 3$

M	Free-stream	Mach	number
1"1	rree-stream	Macil	namper

MRP		Mode1	moment	reference	point	(18.68	in.	from	the
1 11/1	•	11000	moment	i Ci Ci Cinco	POINT	(10.00		1 1 0111	

nose)

P Free-stream static pressure, psia

PBA Average base pressure, (PB1 + PB2 + PB3 + P84/4),

psia

PB; Base pressure, psia, i = 1, 2, 3, 4

PHI Aerodynamic roll angle, deg

PHII Indicated sector roll angle, deg

PN Data point number

PT Tunnel stilling chamber pressure, psia

Q Free-stream dynamic pressure, psia

RE Free-stream unit Reynolds number, ft-1

RUN Data set identification number

T Free-stream static temperature, OR

TRIP Identification of trip ball size, in.

TT Tunnel stilling chamber temperature, OR

V Free-stream velocity, fps

1.0 INTRODUCTION

The work reported herein was performed by the Arnold Engineering Development Center (AEDC), Air Force Systems Command (AFSC), under Program Element 921A71, Control Number 9A71, at the request of the 6585th Test Group/TKE, Holloman Air Force Base, New Mexico. The 6585th Test Group project manager was Mr. Jack Meyers. The results were obtained by Calspan Corporation/AEDC Division, operating contractor for the Aerospace Flight Dynamics testing effort at the AEDC, AFSC, Arnold Air Force Base, Tennessee. The test was performed in the von Karman Gas Dynamics Facility (VKF) Supersonic Wind Tunnel A during the period 4-7 May 1987, under AEDC Project Number CI62VA (Calspan Project Number V41A-37).

The primary objective of this test was to obtain aerodynamic loads data on a 1/12th scale model of a Holloman Narrow-Gage Rocket Sled with and without two top-mounted wedge configurations. The two wedge configuration angles were 4 and 16 deg. This test also used the Image Analyzer Data System (IADS), for the first time on a rocket sled test, to monitor the slipper clearances. This information was also used in calculating the angle of attack of the model with respect to the ground plane. In the past test, the model was assumed to be at an angle of attack of zero deg.

Inquiries to obtain copies of the test data should be directed to the 6585th Test Group/TKE, Holloman AFB, New Mexico 88330. A microfiche record of the tabulated data has been retained by the VKF at AEDC.

2.0 APPARATUS

2.1 TEST FACILITY

Tunnel A (Fig. 1) is a continuous, closed-circuit, variable density wind tunnel with an automatically driven flexible-plate-type nozzle and a 40- by 40-in. test section. The tunnel can be operated at Mach numbers from 1.5 to 5.5 at maximum stagnation pressures from 29 to 200 psia, respectively, and stagnation temperatures up to 750 OR at Mach number 5.5. Minimum operating pressures range from about one-tenth to one-twentieth of the maximum at each Mach number. The tunnel is equipped with a model injection system which allows removal of the model from the test section while the tunnel remains in operation. In this test the full inject/retract capability was not used. The model remained in the test section during tunnel startup and shutdown. A description of the tunnel airflow calibration information may be found in the Test Facilities Handbook (Ref. 1).

2.2 TEST ARTICLE

The Narrow-Gage Rocket Sled model and ground plane assembly, designed and fabricated by Systems Research Laboratories (SRL), is shown installed in Tunnel A in Fig. 2 and schematically in Fig. 3. The model, sting, and ground plane assembly are shown in Fig. 4 and details

of the model, rocket motors and wedges are shown in Figs. 5, 6, and 7, respectively. The baseline configuration is defined as the model without any wedges and is described in Table 1 along with the other two configurations. A trip band was used during the test on the mose of the model to promote early boundary layer transition. Three circular rows of 0.025 in. size balls were placed 0.082 in. apart with 14 balls per row and the middle row 1.0 in. axially from the nose tip (fig. 8).

Before testing, two hardware problems had to be resolved. When the basic model was last run in 1974 (Ref. 2) an AEDC balance (4.04-Y-36-032) was used and had a rated normal force of thirty pounds. This particular balance had a tapered aft section. Since this balance no longer existed and the selected balance (4.00-Y-36-081) had an aft clutch face, the sting had to be altered by machining a matching clutch face. Next, the ground plane had to be reinforced on the sides. A tunnel blockage and stress analyses were performed and a weak section was found just ahead of the existing side plates. This area had to be strengthened to maintain a safety factor of 2 for a marginal block condition when starting and stopping the tunnel with the model in the test section. Extension braces were welded to the existing plates across the weakened area to give the needed support (Fig. 3).

The model could also be driven vertically and in pitch by remotely operated yokes attached to the sting support (Fig. 4). Fouling circuits were used to indicate when contact existed between the model slipper and the rails.

2.3 TEST INSTRUMENTATION

The measuring devices, recording devices, and calibration methods used for all measured parameters are listed in Table 2.

2.3.1 Model Force Instrumentation

Model forces and moments were measured with an internal six-component main balance which was supplied and calibrated by AEDC. Before each shift of the test, static loads were applied to the balance to simulate the range of loads anticipated for the test.

2.3.2 Model Positioning

The model, supported by a balance and sting, could be driven in pitch and height by motor-driven yokes attached to the sting. The roll motor was not used during the test (disconnected) at the users request.

2.3.3 Optical Instrumentation

Model/flow-field shadowgraph and color schlieren photographs were obtained on all three configurations. The photographs were obtained with a double-pass optical flow visualization system having a 35-in.-diam field of view.

The vertical distance from the top of a slipper to the top of the rail was measured with an Image Analyzer Data System (IADS). An IADS print (Fig. 9) shows the magnification and detail of slipper 2 as noted in Fig. 3. The slippers were also electrically isolated from the rails such, that if one or more of the slippers touched a rail, a foul light would turn on at the remote control unit and the drive-motors would stop. This condition indicated which slipper was fouled and was corrected by driving the model slipper to an unfouled position. An override button was interfaced with the remote control unit so that when a slipper fouled and the drive-motors turned off, the override button had to be pressed before the motors could be driven again. This prevented damaging a slipper and gave a moment to think about which motor to drive next to achieve an unfouled position.

Ouring all test runs the distance between the top of the slippers (front and rear) and the top of the rail were measured with the IADS and recorded as shown in Table 3. The clearance between the inside top slipper and rail ranged from about 0.010 to 0.120-in. An example of calculating the model angle of attack is shown in Table 3.

3.0 TEST DESCRIPTION

3.1 TEST CONDITIONS

A summary of the nominal test conditions at each Mach number is given below:

<u>м</u> 3.5	PT .	II	Q	Р	RE x 10-6	Ţ	V
3.5	53	59 0	5.90	0. 6 9	5.5	171	2244
4.0	69	590	5.00	0.45	5.5	140	2324
4.5	109	570	5.30	0.38	7.2	113	2345
5.0	143	660	4.70	0.27	6.0	110	2571
5.5	61	680	1.40	0.07	. 1.9	96	2642

The Tunnel A sidewall Mach number probe was used routinely to monitor deviations from the standard calibrated Mach numbers. When a deviation is measured, the free-stream conditions are corrected and the actual Mach number is printed on the data tabulations. At Mach numbers 5.0 and 5.5, higher total temperatures are required to maintain conditions above air liquefaction. An attempt was made at Mach 5.5 to run at the maximum Reynolds number of 4.5×10^6 (TT = 720, PT = 154), but the balance temperature exceeded the allowable temperature of 180° F and conditions had to be lowered.

A run summary showing all configurations tested and the variables for each is presented in Table 4.

3.2 TEST PROCEDURES

3.2.1 General

In the VKF continuous-flow Wind Tunnel A the model is mounted on a sting support mechanism in an installation tank directly underneath the

tunnel test section. The tank is separated from the tunnel by a pair of fairing doors and a safety door. When closed, the fairing doors, except for a slot for the pitch sector, cover the opening to the tank, and the safety door seals the tunnel from the tank area. After the model is prepared for a data run, the personnel access door to the installation tank is closed, the tank is vented to the tunnel flow, the safety and fairing doors are opened, the model is injected into the airstream, and the fairing doors are closed. After the data are obtained, the model is retracted into the tank, and the sequence is reversed with the tank being vented to atmosphere to allow access to the model in preparation for the next run. The sequence is repeated for each configuration change.

For this test, there was a potentially high risk of model damage due to deflection under airloads during the injection process and the above standard procedures were not used. For each model configuration, tunnel flow was started (at low pressure levels) with the model in the test section, and after data at all desired Mach numbers were obtained, the tunnel was shut-down (again at low pressure conditions). The model was then retracted for the next configuration change and the process repeated.

3.2.2 Data Acquisition

Data were recorded in the manual fixed point-pause mode of operation. The point-pause data were obtained for a value of ALPHA and YAW (zero) with a delay before the first data point to allow the base pressures to stabilize. Each data point for this mode of operation is the result of a Kaiser-Bessel digital filter utilizing 16 samples taken over a time span of 0.333 sec.

3.3 DATA REDUCTION

The Narrow-Gage Rocket Sled data were obtained utilizing the tunnel data acquisition system as described in Section 3.2.2. The force and moment measurements were reduced to coefficient form using the digitally filtered data points and correcting for first and second-order balance interaction effects. Tunnel stilling chamber pressure was also calculated from digitally filtered values. The same reference lengths and areas that were used for the baseline configuration were used for the other configurations.

3.4 MEASUREMENT UNCERTAINTIES

In general, instrumentation calibration and data uncertainty estimates were made using methods recognized by the National Bureau of Standards (NBS) presented in Ref. 3. Measurement uncertainty is a combination of bias and precision errors defined as:

$$U = \pm (B + t95S)$$

where B is the bias limit, S is the sample standard deviation, and t95 is the 95th percentile point for the two-tailed Students "t"

distribution (95-percent confidence interval), which for sample sizes greater than 30 is taken equal to 2.

Estimates of the measured data uncertainties for this test are given in Table 2. With the exception of the force and moment balance, data uncertainties are determined from in-place calibrations through the data recording system and the data reduction program. Static load hangings on each balance simulate the range of loads and center-of-pressure locations anticipated during the test, and measurement errors are based on differences between applied loads and corresponding values calculated from the balance equations used in the data reduction. Load hangings to verify each balance calibration are made in-place on the assembled model.

Propagation of the bias and precision errors of measured data through the calculated data was made in accordance with Ref. 3 and the results are given in Table 2b. Uncertainties for the calculated data are presented for the maximum measured value of each parameter.

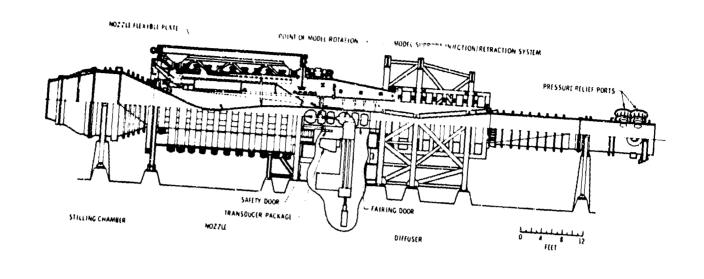
4.0 DATA PACKAGE PRESENTATION

The data package contains tabulated model aerodynamic force and moment data presented in the body axes system. Base pressure data are presented in the form of pressure ratios and coefficients. Final tabulated data obtained during the test are presented in the Appendix.

A complete set of test results in the form of tabulated data with detailed test logs and photographic data were transmitted to the 6585th Group/TKE, Holloman AFB. One printed copy and a micofiche record of this package were retained at AEDC.

REFERENCES

- 1. <u>Test Facilities Handbook</u> (Twelfth Edition), "von Karman Gas Dynamics Facility Vol. 3," Arnold Engineering Development Center, March 1984.
- 2. Rhudy, R. W. and Corce, J. D., "Static Force and Moment Tests of the Holloman Narrow-Gage Rocket Sled at Mach Numbers from 1.5 to 4.0." AEDC-TR-75-29, August 1975.
- 3. Abernethy, R. B. et. al. and Thompson, J. W., "Handbook Uncertainty in Gas Turbine Measurements." AEDC-TR-73-5 (AD 755356), February 1973.



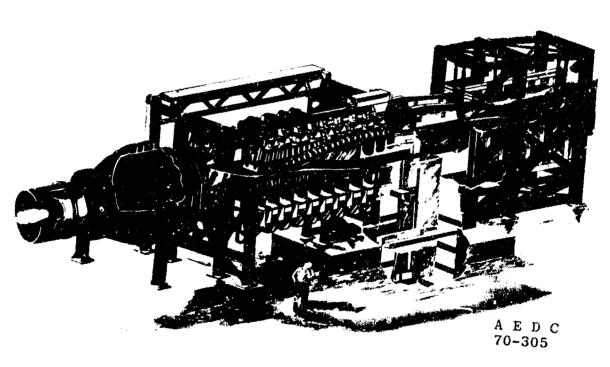


Figure 1. Supersonic Wind Tunnel A



Figure 2. Narrow-Gage Rocket Sled Model Installed in Tunnel A

L=6.90 in.

4.00-Y-36-081 Balance

9

Ground Plane Inclinometer

Sector Hub

Θ Θ

Figure 3. Installation Sketch

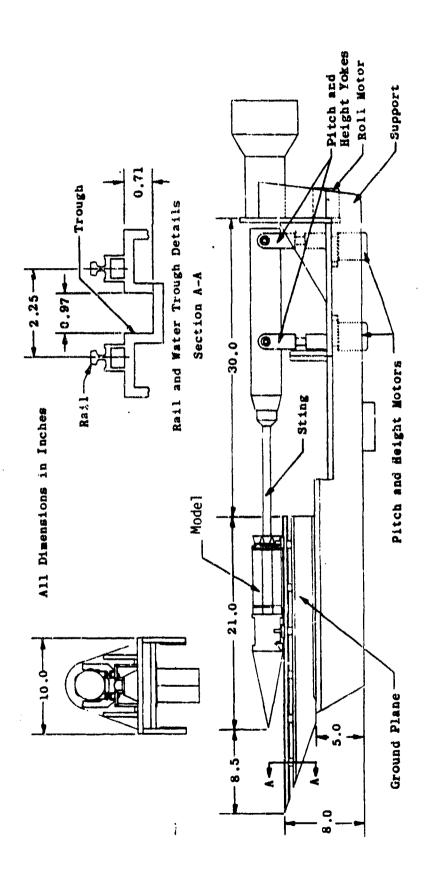


Figure 4. Model, sting, and ground plane assembly.

All Dimensions in Inches

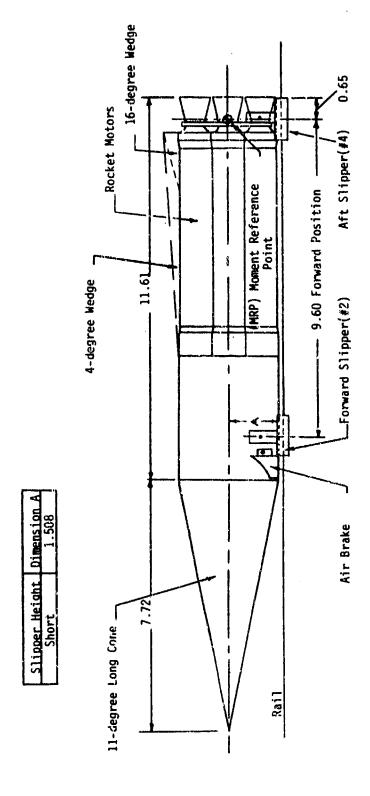
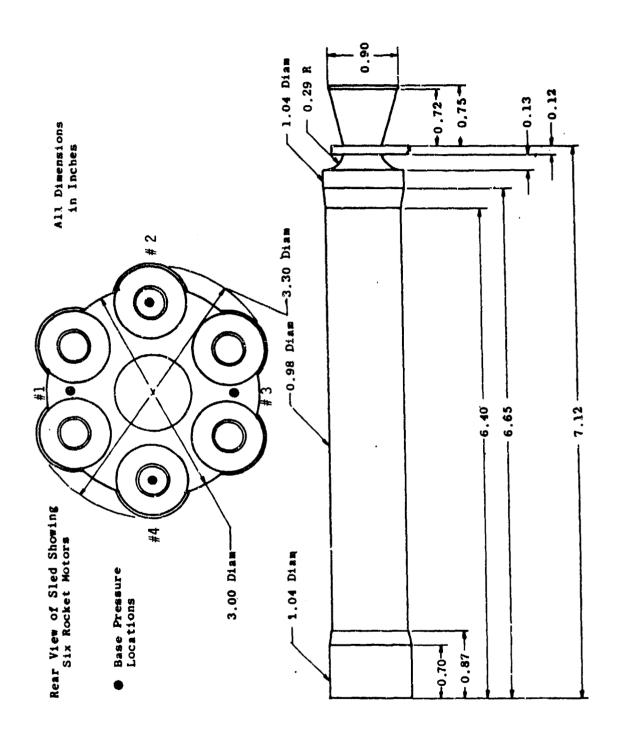
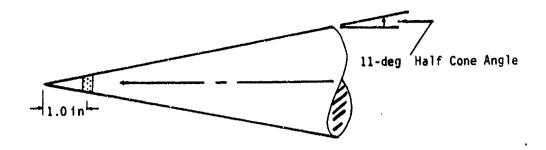


Figure 5. Model Details



16



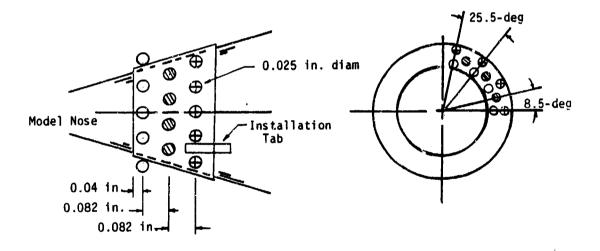
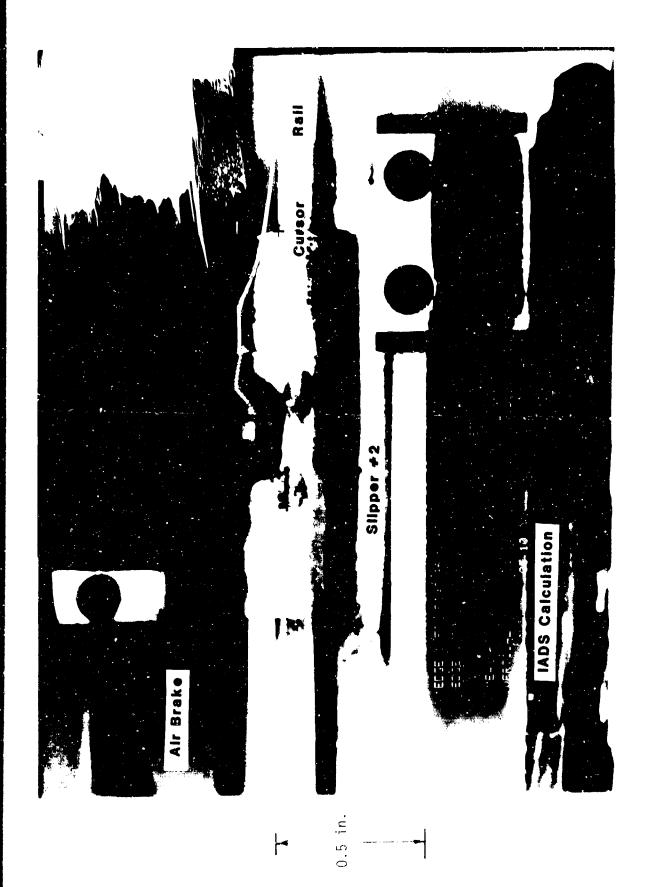


Figure 8. Trip Band



a, Print

Figure 9. Image Analyzer Data System (IADS)

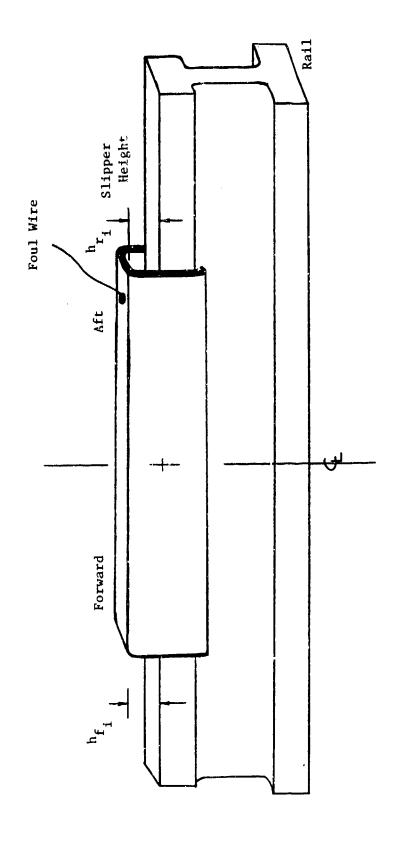


TABLE 1. CONFIGURATION DESIGNATIONS

CODE	CONFIGURATION
1	1.3.2.2.2 (AB = 7.514, A = 8.289)
2	1.3.2.2.2W4
3	1.3.2.2.2W16

COMPONENT	DESCRIPTION
1.X.X.X.X.WXX	Slipper Height (measured from centerline of model to inside top of slipper. 1. Short - 1.508 in.
X.3.X.X.X.WXX	Forward Slipper Location (measured from center of aft slipper to center of forward slipper) 3. Forward - 9.60 in.
X.X.2.X.X.WXX	Bleed Area 2. Closed
X.X.X.2.X.WXX	Nose Shape 2. 11-degree Long Cone
X.X.X.X.2.WXX	Water Brake 2. Off
X.X.X.X.W4	4-degree Long Wedge Length = 6.88" Height = 0.48"
X.X.X.X.W16	16-degree Short Wedge Length = 1.93" Height = 0.55"

Table 2. Estimated Uncertainties a. Measured Parameters

		Ste	eady-State E	stimated M	Steady-State Estimated Measurement						
Parameter Designation	a.	Precision index (S)		8 5	Bias (B)	100 H	Uncertainty ±(8 + t955)	egue g	Type of	Type of	Method of
	Percent of Reading	United	Degree of Freedom	Percent of Readung	Unit of Measurement	Percent of Reading	United		San	Percentage Device	ystem Cattoration
PT pua		0.007 0.017	St. V		1100		0.025	15-60 60-150	Dell & Housel Force balance pressure transducer	Digital data acquistion system analog-to-deptal converter	In place application of multiple pressure levels measured wolf a pressure measured wolf a pressure
π,*		0	3,		5.0		40	0-300	Chrose 16-Aluse 16 thermocouple	Digital thermometer and microprocessor and appropriate and anti-	Thermozoupte vernication of NeSs conformity by voltage substitution cales abon.
Normal Force, Ibs Priching Moment, in-Ibs Side Force, Ibs Yearing Moments, in-Ibs Rolling Moments, in-Ibs Assal Force, Ibs		0.059 0.216 0.207 0.208 0.008	*****		0.000 0.027 0.007 0.045 0.063		0.125 0.463 0.125 0.463 0.125	3	Se-component stran gage balence (4.00-7-36-081)	Ovgstal Jaka acquisition system Static Loading	State condains
ALPHA-GP. deg		70 °	•		700		0.07	22	Servo-actinometer (weter-cocled)	Digital data acquistoon system	pepusoul. captions of property in pepusous captions and a materium perungum perungum perungum perungum perungungan a paga-apa perungungan a paga-apa perungungan a paga-apa perungungan perungungan a paga-apa perungungan perungungan apaga-apa perungungan perungkan perungungan perungkan perung
PG1, PB2, PB3, PB4, psua		0.0015	> 30		0.0015		0.005	0-15	Bek & Howell variable capacitance pressure transducer	Digital data acquisition system Same as PT	Id St dates.

*Reference: Abernethy, R.B. et al and Thompson, J. W. "Handbook Uncertainty in Gas Turbine Measurements." AEDC-TR-23-5, February 1973.

Table 2. Continued b. Calculated Parameters

	Nominal	A SIGN	3.5	4.0	4.5	5.0	5.5	69.0	6.45	0.38	0.27	0.07	5.9	5.0	5.3	4.7	1.4	5.50	5.50	7.20	9 .00	1.93	0.28	0.30	0.38	0.37	0.36	0.65	0.67	0.85	28.0	0.81
	Nominal Mach	Number	3.5	4.0	4.5	2.0	5.5	3.5	4.0	4.5	2.0	5.5	3.5	4.0	4.5	2.0	5.5	3.5	4.0	4.5	5.0	5.5	3.5	0.4	4.5	2.0	5.5	3.5	4.0	4.5	5.0	5.5
	Uncertainty ± (B + t955)	Unit of Measurement	0.012	0.018	0.022	0.026	0.016	0.013	0.013	0.013	0.009	0.005	0.072	0.086	0.107	6.104	0.019						0.0038	0.0057	0.0084	0.0084	0.0066	0.0093	0.0134	0.0179	0.0190	0.0143
	Unce ± (B	Percent of Reading																1.34	1.60	1.75	1.80	1.32										
Steady-State Estimated Measurement*	Bias (B)	Unit of Measurement						0.001	0.001	0.001	0.001	0.001	0.012	0.010	0.011	0.010	0.003						90000	0.0007	90000	0.0008	0.0010	0.0015	0.0016	0.0019	0.0018	V. VV&. J
dy-State Estim	8	Percent of Reading																0.54	0.54 4	0.55	0.50	0.48					٠					
Stea	Precision Index (S)	Unit of Measurement	900'0	0.00	0.011	0.013	0.008	9000	9000	9000	0.00	0.001	0.030	0.038	0.048	0.047	900.0						0.0016	0.0025	0.0035	0.0038	0.0028	0.0039	0.0059	0.0080	0.0086	
	Precisi)	Percent of Reading																6.40	0.53	0.60	6.65	0.42										
	Parameter Designation		Σ					۵.					o					RE x 10-6					3					CLM				

*Reference: Abernethy, R.B. et al and Thompson, J. W. *Handbook Uncertainty in Gas Turbine Measurements. * AEDC-TR-73-5, February 1973.

Table 2. Concluded b. Concluded

Seeden streets (Streets Seeden) seeden Streets Streets (Streets Seeden)

		Ste	ady-State Estim	Steady-State Estimated Measurement*				
Parameter Designation	Precisio (Precision Index (S)	8	Bias (B)		Uncertainty ± (B + t95S)	Nominal Mach	Nominal
	Percent of Reading	Unit of Measurement	Percent of Reading	Unit of Measurement	Percent of Reading	Unit of	Number	Value
ک ·		0.0003		0.3001		0 0007	3.5	0.02
		0.0003		0.0002		0.0008	0.4	0.00
		0.0004		0.0002		0.0010	4.5	0.0
		0.000		0.0002		0.0010	5.0	0.02
		0.000		2000		0.0020	2.5	0.02
		0.0010		90000		0.0026	3.5	0.0g
		0.0012		0.0007		0.0031	4.0	0.02
		0.3012		0.0007		0.0031	2.4	0.01
		0.0013		0.0008		0.0034	5.0	90.0
		0.0036		0.0026		0.0098	5.5	0.07
ฮ		0.0004		0.0001		6000.0	3.5	-0.003
		0.000		0.0001		6000:0	4.0	-0.005
		0.0005		0.0001		0.0011	4.5	-0.003
		0.0005		0.0001		0.0011	5.0	-0.001
		0.0009		0.0004		0.0022	5.5	-0.001
প্ৰ		0.0028		0.0016		0.0072	3.5	0.34
		0.0037		0.0017		0.3091	4.0	0.33
		0.0040		0.0016		9600.0	4.5	0.33
		0.0044		0.0018		0.0106	5.0	0.35
		0.5044		0.0055		0.0143	5.5	0.37
3		0.0022		0.0015		0.0059	3.5	0.39
		0.0030		0.0017		0.0077	4.0	0.37
		0.0034		0.0016		0.0084	4.5	0.35
		0.0038		0.0018		0.0094	5.0	0.36
		0.0041		0.0055		0.0137	5.5	0.38

*Reference: Abernethy, R.B. et al and Thompson, J. W. "Handbook Uncertainty in Gas Turbine Measurements." AEDC-TR-73-5, February 1973

Table 3. Image Analyzer Slipper Height Measurements

	Slipp	er #1	Slipp	er #2	Slipp	er #3	Slipp	er #4	
Run	Front	Rear	Front	Rear	Front	Rear	Front	Rear	Alpha
	hr	h _r ,	h _{f₂}	h _{rz}	hf3	h _{r3}	h _{f4}	h _{r4}	1 71,0110
1	0.132	0.140	0.140	0.123	0.148	0.123	0.091	0.140	0.05
3	0.153	0.148	0.169	0.132	0.090	0.074	0.090	0.070	0.41
4	0.099	0.107	0.091	0.103	0.140	0.132	0.111	0.149	-0.20
5	0.173	0.161	0.157	0.161	0.186	0.169	0.157	0.186	-0.07
6	0.074	0.083	0.066	0.070	0.156	0.144	0.132	0.169	-0.46
7	0.145	0.140	0.140	0.156	0.182	0.182	0.161	0.189	-0.20
8	0.157	0.144	0.095	0.144	0.148	0.136	0.161	0.156	-0.09
9	0.161	0.157	0.153	0.161	0.149	0.128	0.136	0.153	0.10
10	0.119	0.140	0.128	0.132	0.169	0.161	0.153	0.165	-0.20
12	0.165	0.149	0.161	0.140	0.078	0.062	0.078	0.086	0.46
13	0.149	0.153	0.145	0.153	0.145	0.149	0.124	0.157	0.04
14	0.145	0.149	0.149	0.145	0.136	0.128	0.107	0.144	0.11
15	0.157	0.145	0.169	0.148	0.140	0.144	0.099	0.148	0.13
16	0.141	0.137	0.140	0.140	0.132	0.140	0.132	0.152	0.00
17	0.182	0.173	0.153	0.157	0.157	0.157	0.165	0.173	0.02
18	0.161	0.165	0.157	0.161	0.153	0.153	0.140	0.165	0.05
19	0.120	0.130	0.124	0.127	0.120	0.111	0.100	0.123	0.07
20	0.124	0.116	0.116	0.107	0.116	0.103	0.103	0.120	0.03

A. Equations

$$\overline{H}_{F} = [(h_{f_{1}} + h_{r_{1}}) + (h_{f_{2}} + h_{r_{2}})]/4$$

$$\overline{H}_{R} = [(h_{f_{3}} + h_{r_{3}}) + (h_{f_{4}} + h_{r_{4}})]/4$$

$$\alpha \quad (deg) = TAN^{-1} \frac{\overline{H}_{F} - \overline{H}_{R}}{D_{s}}, \text{ where } Q = 9.6$$

B. Sample Calculation of Run #3

$$H_{F} = [(0.153 + 0.148) + (0.169 + 0.132)]/4$$

$$H_{F} = 0.1505$$

$$H_{R} = [(0.090 + 0.074) + (0.090 + 0.070)]/4$$

$$H_{R} = 0.0810$$

$$\alpha = TAN^{-1} = 0.1505 - 0.0810 - 0.0810$$

$$\alpha = 0.41$$

TABLE 4. RUN SUMMARY

Mach No.	0		CONFIGURATION	NS
Macil NO.	Q	1.3.2.2.2	1.3.2.2.2.W4	1.3.2.2.2.W16
3.5	5.9	15	18	19
4.0	5.0	16	17	20
4.5	5.3	1, 3	8	12, 13
5.0	4.7	4, 5	9	14
5.5	1.4	6, 7	10	

APPENDIX

### PE TT G F CPBA CABT PBA/F PB1/F PB2/F PB4/F	4,52 108,0	PI TT 1010 108.01	0 0 2 2 0 6	P 0,354	P T 0,354 112,4	PE 0.705E+07	A 07 8.289		REF LENGTHS(CLM,CLM,CLL)	S(CLM,CLN, 2,200	VA-37 Lh,CLL) 2,200
FF TT G F CPBA CABT PBA/F PB1/F PB2/P PB3/F 108,01 571,7 5,206 0,364 -0.0235 0,0213 0,6636 0,6864 0,4054 1,1755 1,06,37 5,209 0,364 -0.0234 0,0712 0,8654 0,8864 0,4079 1,18014 108,05 571,7 5,209 0,364 -0.0234 0,0212 0,8659 0,8884 0,4083 1,1831 107,99 571,7 5,205 0,364 -0.0234 0,0212 0,8659 0,8885 0,4082 1,1831			:	TUNNEL	rkip 0.025 CUNDITI	INS, BASE	F PRESSU	88.5 e e e			
	# • • • • • • • • • • • • • • • • • • •		5.200 5.200 5.200 5.200 5.200		CPBA -0.0.335 -0.0234 -0.0234 -0.0233	CABT 0.0213 0.0212 0.0212 0.0211	PBA/F 0.6636 0.06536 0.0656 0.6659	7 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		P63/P1035	PB4/P 0.3859 0.3856 0.3857 0.3857 0.3859
	5 H I	C14 C14 0.3572 0.7994 0.3571 0.7988 0.3572 0.7988 0.3570 0.7988		CY 6,6078 0,0081 9,0081	CLN 0.0174 0.0178 0.0177	177 10,000 1		00.000	CA 0.3283 0.3283 0.3284	MCP/LM 0.6191 0.6192 0.6192	1CP/LM 0.7131 0.7159 0.717

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THE CUDE M PI TT G P T T RE A REF LENGTHS(CLM.CLLL) COMFIG. 1.3.2.2.2. COMFIG. 1.3.2.2.2. IUMNEL CUMDITIONS, BASE PRESSURES PM ALPI PHII PF TT G P CPAA CABT PBA/P PB1/P L409 1.2161 0.4 2 -0.00 0.00 108.89 571.7 5.236 0.366 -0.0231 0.0569 0.0449 0.4093 1.2161 0.4 4 -0.00 0.00 108.89 571.7 5.248 0.367 -0.0231 0.0509 0.0446 0.4084 1.2187 0.4 5 -0.00 0.00 108.89 571.7 5.248 0.367 -0.0231 0.0209 0.0496 0.0476 0.4084 1.2187 0.4 5 -0.00 0.00 0.3941 0.9009 0.095 0.0006 0.3511 0.4084 1.2187 0.4 5 -0.00 0.3941 0.9009 0.0055 0.0006 0.3511 0.3302 0.06116 5 0.41 0.00 0.3941 0.9009 0.0052 0.0006 0.3512 0.3302 0.6116 5 0.41 0.00 0.3941 0.9009 0.0052 0.0006 0.3512 0.3302 0.6116 5 0.41 0.00 0.3941 0.9019 0.0052 0.0006 0.3512 0.3302 0.6116 5 0.41 0.00 0.3941 0.9019 0.0052 0.0006 0.3512 0.3302 0.6116 5 0.41 0.00 0.3941 0.9019 0.0052 0.0006 0.3512 0.3302 0.6116 5 0.41 0.00 0.3941 0.9013 0.0051 0.0005 0.3512 0.3302 0.6116 5 0.41 0.00 0.3941 0.9013 0.0051 0.0005 0.3512 0.3302 0.6116 5 0.41 0.00 0.3941 0.9013 0.0051 0.0005 0.3512 0.3302 0.6116 5 0.41 0.00 0.3941 0.9013 0.0051 0.0005 0.3512 0.3302 0.6116	CALSPAN AEDC UI VON KAR ARNOLE HOLLUMA PAGE 1	CALSPAN JRPORATION AEDC ULVISIUN VON KARMAN GAS DYNAN ARNOLE AIM FURCE STA HULLUMAN KOCKET SLED	JRFORATION SIUN N GAS DYNA N FURCE ST NUCKET SEE	LAUSFAN JRFURALIUN AEDC ULVISIUN AUN KARMAN UAS DYNAMICS FACILITY ARMOLE AIM FÜRCE STATION, TEHHESS HULLUMAN MÜCKET SLED		<u></u>							TIME OATE F TIME F PROJECT	TIME COMPUTED DATE RECONDED TIME RECUNDED PHOJECT NUMBER	9-JUN-67 10:15:50 5-MAY-67 23:45:51 VA-37
ALPI PHII PI 1T Q P CPWA CART PBA/P PBI/P FB2/P -0.025 -0.00 0.00 108.03 571.7 5.236 0.366 -0.0231 0.0209 0.6659 0.6489 0.4099 -0.00 0.00 108.03 571.7 5.241 0.366 -0.0231 0.0209 0.6659 0.6489 0.4099 -0.00 0.00 108.89 571.7 5.241 0.367 -0.0231 0.0209 0.6659 0.6489 0.4099 -0.00 0.00 108.89 571.7 5.248 0.367 -0.0231 0.0209 0.6659 0.6489 0.4089 -0.00 0.00 108.89 571.7 5.248 0.367 -0.0231 0.0209 0.6659 0.6489 0.4089 -0.00 0.00 108.89 571.7 5.248 0.367 -0.0231 0.0209 0.6696 0.6489 0.4089 -0.00 0.00 0.3941 0.9008 0.0357 -0.0006 -0.0009 0.3511 0.3302 0 2 0.41 0.00 0.3941 0.9009 0.0052 0.0073 -0.0006 0.3512 0.3302 0 3 0.41 0.00 0.3941 0.9009 0.0050 0.0065 -0.0006 0.3512 0.3302 0 4 0.41 0.00 0.3941 0.9009 0.0050 0.0065 -0.0006 0.3512 0.3302 0 5 0.41 0.00 0.3941 0.9009 0.0050 0.0055 -0.0006 0.3512 0.3302 0 5 0.41 0.00 0.3941 0.9009 0.0050 0.0050 0.3512 0.3302 0 5 0.41 0.00 0.3941 0.9009 0.0050 0.0050 0.3512 0.3302 0 6 0.41 0.00 0.3941 0.9001 0.0050 0.0050 0.3512 0.3302 0 6 0.41 0.00 0.3941 0.9011 0.0050 0.0050 0.3512 0.3302 0 6 0.41 0.00 0.3941 0.9011 0.0050 0.0050 0.3512 0.3302 0	KUN 3	CUDE	# .52	P.F. 104.63	TT 571.7	0 5.236	P 0.366		RE 0.710€+			LENGTHS 000 2	. 200 . 200	,CLL) 2,200	
ALPI PHII PI TT 0 P CPBA CABT PBA/P PB1/P + B2/P - U_UU 0.00 10w_b3 571.7 5.236 U_366 -0.0231 0.0209 U_b699 U_b499 U_b499 U_b699 U_b6999 U_b6999 U_b6999 U_b699 U_b6999 U_b6999 U_b6999 U_b6999 U_b6999 U_b6999 U_b6999 U_b	1,3,	CONF1G 2.2.2.						FRIP 0.025							
ALPI PHII PF 1T 0 F CPWA CABT PBA/F PB1/F PB2/P -0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.						i	-TUNNEL	, CUNDITI	ONS, BAS	E PRESSU	RES				
-0.00 0.60 108.75 571.7 5.241 0.367 -0.0232 0.0210 0.6686 0.5484 0.4089 -0.00 108.94 571.7 5.248 0.367 -0.0231 0.0210 0.6686 0.5484 0.4089 -0.00 108.89 571.7 5.248 0.367 -0.0231 0.0209 0.5696 0.6473 0.4084 -0.00 0.00 108.89 571.7 5.248 0.367 -0.0231 0.0209 0.5696 0.6476 0.4084 ALPHA PHI CN CLM CY CLN		ALP1	11H9 00.00	P.F. 104.03	1T 571.7	6.236 5.236	P. 366		CABT 0.0210	PBA/P 0.0689 0.6646	P81/F 0.6474 0.5489		PB3/P 1,2161	984/P 0.4029	
ALPHA PHI CM CLM CY CLN		000	0000	108.75	571.7	5.241	0,367	-0.0232	0.0210	98990	C. 6484			0.4018	
ALEHA PHI CM CY CLN CLL CAT CA 0.41 0.00 0.3941 0.9008 0.0050 0.0056 -0.0006 0.3511 0.3302 0.41 0.00 0.3941 0.9009 0.0052 0.0053 -0.0007 0.3514 0.3302 0.41 0.00 0.3943 0.9013 0.0040 0.0059 -0.0006 0.3512 0.3302 0.41 -0.00 0.3941 0.9011 0.0051 0.0059 -0.0006 0.3512 0.3302 0.41 0.00 0.3941 0.9011 0.0051 0.0072 -0.0007 0.3512 0.3302		00.0-	0.00	108.89	571.7	5.248	0.367	-0.0231	0.0209	9694.0	0.6476			6.4038	
ALPHA PHI CN CLM CY CLN CLN CAL CAL CAL CAL CAL 0.3941 0.3941 0.908 0.0050 0.006 -0.000 0.3511 0.3302 0.41 0.00 0.3941 0.9008 0.0052 0.0073 -0.0007 0.3514 0.3305 0.41 0.00 0.3943 0.9015 0.0049 0.0065 -0.0006 0.3512 0.3302 0.41 -0.00 0.3943 0.9013 0.0050 0.0069 -0.0006 0.3512 0.3302 0.41 0.00 0.3941 0.9011 0.0051 0.0072 -0.0007 0.3512 0.3302									AXES						•
	3-1 CM TM TM TM	ALFHA 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	H 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		33300		0.050 0.050 0.0052 0.0049 0.0050	20000000000000000000000000000000000000			35 E E E E E E E E E E E E E E E E E E E	C. 3302 0.3302 0.3302 0.3302	0.6116 0.6116 0.6116 0.6116 0.6116	H 1765/14	FOUL

						•											
1 0 1 0 M 2 0 C C C C C C C C C C C C C C C C C C	2,200			P84/P	0.4431	0.4428	0.4426	0.4425	0.4424		XCP/LM	0.5869	0.6021	0.5918	0.5921	0.5833	0,5856
9-10216111 0-10116111 0-1116111 0-111161 0-111161	S(CLM,CLN, 2,200			P83/P	1.4855	1.4843	1.4811	1.4807	1,4833		NCP/LM	0.6158	0.6161	0,6159	0.6158	0.6156	0,6158
DATE COMPUTE. TIME COMPUTED DATE RECORDED TIME RECORDED PROJECT NUMBER	NGTH			PB2/P	0.4217	0.4214	0.4212	0.4211	0.4211		CA						
DATE TIME DATE TIME PROJE			£.S	PB1/P	C.0692 C.0688	U.0687	0.6684	U.6682	0.6682		CAT						
	687 8.89		PRESSURES		0,7549		0.7533				ŭ						
	RE U.583E+07		BASE		0.0124 U					XES	כרו	-0,0093	-0.0096	+600°0-	-0,0097	-0.0n94	+600.0-
	T 103.9	1kIP 0.025	TUNNEL CUNDITIONS,		-0.0137					HUNY AXES	X)	-0.0263	-U.0238	-0.0256	-0.0256	-c.0268	-0.0200
	P U.253		-TUNNEL		6.253 0.253					•	CX	-0.0019	-0.0074	-0.0078	-0.007B	-0.0080	-0.0078
4	0 4.528		•	3	4.528	4,532	4.534	4,535	4,535		CLM						
C ILITY Terressee	TT 660.7			7.7	660.7	661.7	660.7	661.7	601.7								
CALSPAN JHPORATION AEDC DIVISION VON KARMAN GAS DYNAMICS FACILITY ARNULD AIN FORCE STAFION, TERRES HOLLOMAN HOCKET SLED	P1 143.34			4	143.44	143,46	143,51	143,55	143.56		ť	0.356	0.35	0.35	0,355	0.356	0,3562
APORATION SION GAS DYNA N CAS DYNA N FORCE SI	5.06			PHII					0.01		PHI	10.0-	10.0-	•0.01	-0.01	-0.61	-0.01
CALSPAN JEPORATION AEDC DIVISION VON KARMAN GAS DYMAMICS FJ ARNULD AIN FORCE STATION, HOLLOMAN MOCKET SLED	CODE	CONF1G 1.3.2.2.2.	•	ALFI	3 3	.05	60.0	30.0	0°08		ALPHA	-0.20	-0.20	-0.20	-0.20	-0.20	-0.20
CALSPAN AEDC UI VON KARN ARNULD HOLLOMA	AUR A	1.3.		T.	- 2	~,	₹	S	•		Z.		7	~	•	S	Ō

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687 687 131 131				P64/F	0.4057	0.4060	4083	0.4964	6904.0		YCP/LM	0.5442	0.5425	0.5471	0.5448	0.5459	
9-JUM-87 10:16-43 6-MAY-87 2:43:31 VA-37	CLM, CLL) 2,206																
COMPUTE. COMPUTED RECONDED RECORDED CT NUMBER	S(CLM,										MCP/LM	0,6190	0.6187	0.6185	0.5188	0,6186	
DATE COMPUTE. TIME COMPUTED DATE RECOMDED TIME RECORDED PROJECT NUMBER	REF LENGTHS(CLM,CLM,CLL) 3.000 2.200 2.20G						0.4135		0.4121		5	0.3519	0.3521	1,3519	0.1517	0.3518	
21217			ES	P81/P	0.6845	0.05/7	0.6871	0.6857	0.6865		CAT						
	8.289		BASE PRESSURES			0.7522					ŭ	0.3043	0.3544	0.3644			
	RE 0.588E+07		BASE. P								מני	4900.0-	-B.0063	-0.0064	-0.0062	-0.0063	•
	98 0.588		ONS,	CABT	0.0124	6.0124	0.01	0.01	0,0125	eur axes							
	T 107.3	TRIP 0.025	CUNDITI	CPBA	-0.0137	-0.0136	-0.0137	-0.0139	-0.0138	X408	CLN	U.0662	0.0668	0.0659	0.0671	0.0676	
	P 0.253		TUNNEL CUNDITIONS,	2		0.253				·	CX	0.0179	0.0179	0.0179	0.0181	0.0183	
ia a	0 4.531		i	œ	4.531	4.527	4.532	4.524	4,518		CLH	0.8505	8516	8535	9206	0,8511	
CLLITY Ternessee	TT 656.7			11	656.7	53.K	656.7	657.7	1.159		Ü	o 66	01 0.				
HICS FA Ation, D	Pr 143,42			4 4	143.42	143,30	143.44	143.18	143.01		72 ()	0.379	0.380	0.380	0.379	0.379	
CALSPAN , AFORAȚIOH AEDC DIVISIUN VON KARMAN GAS DYNAMICS F AKNOLU AIK FÜKCE STATION, HÜLLOMAN KOCKET SLED	S.06			PHII	00.0-	00.00					PHI	-0.01	-0.01	-0.01	-0,01	-0.01	
CALSPAN , APO AEDC DIVISIUN VON KARMAN GA VON KARMAN GA AKNOLU AIK PU HULLOMAN KOCK	CODE	CUNF1G		ALFI							ALPHA	10.0-	-0.07	10.0-	10.0-	-0.07	
CALSPA AEOC D VON KA ARNOLU HULLOM PAGE 1	RUN S	1.3.2			- (S	-		a.	-				Ś	

CINFIG	AEDC D VUN KA ARNULU HULLUM PAGE 1	AEDC DIVISION VON KARMAN GAS DYNAMICS ARNULU AIN FÜRCE STAFIÜN HULLÜMAN HÖCKET SLED	IN JAS DYNJ TORCE ST KET SLE	Z	FACILITY • TENNESSEE	4 33						THE CURTUED TIME RECORDED FROJECT NUMBER		1):10:10 6:14 6:10 4:15:15 V4-37
ALPI PHII PT TT Q PEASURES PRESSURES PASE PRESSURES PASE PASSURES PASE PASSURES PASS	2 0 2 2 3	CUPE 1	5. 5. 5.		TT 677.				RE 0.192E+	35		LENGTHS 000 2	נכראיכרו 200	4,CLL) 2,200
ALPI PHII PT TT 0 " CPBA CABT PBA/P PB1/P PB2/P PB3/P U.V.U.Z 0.01 59.79 h77.7 1.361 0.064 -0.0130 0.0118 0.7231 0.7571 0.4569 1.2212 0.002 0.01 59.79 h77.7 1.361 0.064 -0.0130 0.0118 0.724 0.7571 0.4553 1.2222 0.00 59.74 677.7 1.361 0.064 -0.0130 0.0118 0.7244 0.7577 0.4573 1.2222 0.00 59.74 677.7 1.360 0.064 -0.0130 0.0118 0.7244 0.7577 0.4573 1.2222 0.00 59.74 677.7 1.360 0.064 -0.0130 0.0118 0.7244 0.7577 0.4573 1.2222 0.00 59.74 677.7 1.361 0.064 -0.0130 0.0118 0.7249 0.7577 0.4573 1.2222 0.00 59.78 677.7 1.361 0.064 -0.0130 0.0118 0.7248 0.7577 0.4573 1.2216 0.002 0.00 59.78 677.7 1.361 0.064 -0.0130 0.0118 0.7248 0.7571 0.4569 1.2212 0.002 0.00 59.78 677.7 1.361 0.064 -0.0130 0.0118 0.7248 0.7571 0.4569 1.2212 0.002 0.00 59.78 0.002	1.3.2	.2.2.						TRIP 0.025	-					
ALPI PHII PT TT 0						•	TUNNEL			E PRESSU	IRES			
U.U2 0.01 59.79 677.7 1.361 0.064 -0.0130 0.0118 0.7237 0.7570 0.4568 1.2212 0.02 0.01 59.79 677.7 1.361 0.064 -0.0136 0.0118 0.7234 0.7571 0.4559 1.2212 0.002 0.010 59.74 677.7 1.360 0.064 -0.0130 0.0118 0.7244 0.7577 0.4573 1.2221 0.02 0.010 59.74 677.7 1.360 0.064 -0.0130 0.0118 0.7249 0.7577 0.4573 1.2221 0.02 0.01 59.76 677.7 1.360 0.064 -0.0130 0.0118 0.7240 0.7573 0.4573 1.2212 0.02 0.01 59.76 677.7 1.361 0.064 -0.0130 0.0118 0.7240 0.7573 0.4579 1.2212 0.02 0.01 59.78 677.7 1.361 0.064 -0.0130 0.0118 0.7240 0.7573 0.4559 1.2212 0.02 0.00 59.78 677.7 1.361 0.064 -0.0130 0.0118 0.7240 0.7571 0.4569 1.2212 0.00 59.78 677.7 1.361 0.064 -0.0130 0.0118 0.7240 0.7571 0.4569 1.2212 0.046 -0.01 0.3352 0.7270 0.0229 0.1077 -0.0227 0.3834 0.3717 0.6298 0.0494 -0.01 0.3353 0.7270 0.0229 0.1078 -0.0227 0.3834 0.3717 0.6298 0.0040 -0.01 0.3353 0.7270 0.0229 0.1076 -0.0228 0.3844 0.3723 0.6298 0.0029 0.1076 -0.0228 0.3844 0.3723 0.6297 0.0040 -0.001 0.3353 0.7277 0.0229 0.1076 -0.0228 0.3844 0.3723 0.6297 0.6297 0.0040 0.0060 0.0		ALP1	PHI1	PT	TT	9	3.	CPBA	CABT	PBA/P	PB1/P	PB2/P	P83/P	PB4/P
U.U.Z 0.01 59.78 677.7 1.361 U.U.S4 -0.0116 U.7238 U.7238 U.7571 U.4569 1.2212 U.02 0.010 59.74 677.7 1.360 U.054 -0.0130 U.0118 U.7244 U.7577 U.4573 1.2222 U.02 0.010 59.76 677.7 1.360 U.054 -0.0130 U.018 U.7249 U.7577 U.4573 1.2212 U.02 0.01 59.76 677.7 1.360 U.064 -0.0130 U.018 U.7249 U.7577 U.4573 1.2212 U.02 0.01 59.76 677.7 1.361 U.064 -0.0130 U.018 U.7249 U.7577 U.4569 1.2212 U.02 U.02 U.03 0.018 U.7249 U.7577 U.4569 1.2212 U.02 U.02 U.03 U.03 U.03 U.03 U.03 U.03 U.03 U.03		0.02	0.01		477.7	1,361	0.064	-0.0130	0.0118	0,7257	0.757			
HUDY AKES		0.02	00.0		677.	1,361	C. USA	9610.0-	0,0118	0,7238	0.157			
U-UZ 0.01 59.74 577.7 1.360 0.064 -0.0130 0.0118 0.7243 0.7577 0.4573 1.2221 0.002 0.01 59.74 577.7 1.361 0.064 -0.0130 0.0118 0.7249 0.7573 0.4570 1.2212 0.002 0.001 59.74 577.7 1.361 0.064 -0.0130 0.0118 0.7249 0.7573 0.4569 1.2212 0.002 0.002 0.002 0.0018 0.7573 0.4569 1.2212 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.3130 0.3717 0.6298 0.3835 0.3717 0.6298 0.3835 0.3717 0.6298 0.3835 0.3717 0.6298 0.3835 0.3717 0.6298 0.3835 0.3717 0.6298 0.3835 0.3717 0.6298 0.3835 0.3717 0.6298 0.3835 0.3717 0.6298 0.3835 0.3717 0.6298 0.3835 0.3717 0.6298 0.3835 0.3717 0.6298 0.3835 0.3717 0.6298 0.3835 0.3717 0.6298 0.3835 0.3717 0.6298 0.3835 0.3717 0.6298		20.0	50.0		1.119	1 . 360	\$40°0	-0.0130	0.0118	0.7244				•
0.02 0.01 59.76 677.7 1.360 0.064 -0.0130 0.0118 0.7240 0.7573 0.4570 1.2215 0.02 0.00 59.78 677.7 1.361 0.064 -0.0130 0.0118 0.7240 0.7571 0.4569 1.2212		70.0	0.0		611.1	1.360	0.064	-0.0136	0.0112	0.7243				
0.02 0.00 59.78 b77.7 1.361 0.064 -0.0130 0.0118 0.7238 0.7571 0.4569 1.2212 HUDY AXES 1 -0.45 -0.01		70.0	10.0		617.7	1.360	₹90° 0	-0.0130	0,0118	0.7240				
ALPHA PHI CN CLM CLM CLL CAF		0.02	00.0		677.7	1,361	0.064	-0.0130	0.0118	0.7238	.757			
ALPHA PHI CN CLM CX CLN CLL CAF CAF CAF CA NCP/LM -0.4c -0.01 0.3352 0.7279 0.1029 0.1077 -0.0227 0.3836 0.3717 0.6298 -0.4c -0.01 0.3352 0.7270 0.1029 0.1080 -0.0227 0.3836 0.3717 0.6298 -0.4c -0.01 0.3352 0.7271 0.0230 0.1080 -0.0227 0.3835 0.3717 0.6298 -0.4c -0.01 0.3352 0.7272 0.0229 0.1080 -0.0228 0.3849 0.3722 0.6298 -0.4c -0.01 0.3353 0.7272 0.0229 0.1078 -0.0228 0.3849 0.3722 0.6297 -0.4c -0.01 0.3353 0.7272 0.0229 0.1078 -0.0228 0.3839 0.3721 0.6297														
ALPHA PHI CN CLM CLM CLN CLL CAF CAF CAF CAF CA NCP/LM -0.40 -0.01 6.3352 0.7269 0.0229 0.1077 -0.0227 0.3836 0.3717 0.6298 -0.40 -0.01 0.3352 0.7270 0.0229 0.1078 -0.0227 0.3836 0.3717 0.6298 -0.40 -0.00 0.3352 0.7271 0.0239 0.1080 -0.0227 0.3835 0.3717 0.6298 -0.40 -0.01 0.3353 0.7270 0.0230 0.1080 -0.0227 0.3835 0.3723 0.6298 -0.40 -0.01 0.3352 0.7272 0.0228 0.1076 -0.0228 0.3849 0.3722 0.6297 -0.40 -0.01 0.3353 0.7272 0.0229 0.1078 -0.0228 0.3839 0.3721 0.6297								-=- HUDY						
-0.4c -0.61 6.3352 0.7269 0.0229 0.1077 -0.0227 0.3836 0.3717 0.6298 -0.4c -0.01 0.3352 0.7270 0.0229 0.1078 -0.0227 0.3834 0.3719 0.6298 -0.4c -0.60 0.3352 0.7271 0.0230 0.1080 -0.0227 0.3835 0.3717 0.6298 -0.4c -0.60 0.3353 0.7270 0.0230 0.1080 -0.0227 0.3841 0.3723 0.6298 -0.4c -0.01 0.3352 0.7272 0.0226 0.1076 -0.0228 0.3846 0.3722 0.6297 -0.4c -0.01 0.3353 0.7272 0.0229 0.1078 -0.028 0.3839 0.3721 0.6297		ALPHA	PHI	S		CLM	CX	CEN	70	ند	CAE	Ċ	NCP/LM	ICP/LI
-0.40 -0.01 0.3352 0.7270 0.0229 0.1078 -0.0227 0.3834 0.5719 0.6298 -0.4040 -0.60 0.3352 0.7271 0.0230 0.1080 -0.0227 0.3835 0.3717 0.6298 -0.40 -0.60 0.3353 0.7270 0.0230 0.1080 -0.0227 0.3841 0.3723 0.6298 -0.40 -0.01 0.3352 0.7272 0.0224 0.1076 -0.0228 0.3849 0.3722 0.6297 -0.40 -0.01 0.3352 0.7272 0.0229 0.1078 -0.028 0.3839 0.3721 0.6297		-0.40	-0.63	6.33		.7269	0.0229	0.107			3E36	0.3717	0.6298	0.431
-0.4c -0.60 0.3352 0.7271 0.0230 0.1080 -0.0227 0.3635 0.3717 0.6298 -0.44c -0.01 0.3353 0.7270 0.0230 0.1080 -0.0227 0.3841 0.3723 0.6298 -0.4c -0.01 0.3352 0.7272 0.0228 0.1076 -0.0228 0.3846 0.3722 0.6297 -0.4c -0.01 0.3352 0.7272 0.0229 0.1078 -0.028 0.3839 0.3721 0.6297		-0.40	-0.01	0.33		.7270	0,0229	0.107			3834	0.3719	0.6298	0.431
-0.4e -0.01 0.3353 0.7270 0.0230 0.1080 -0.0227 0.3841 0.3723 0.6298 -0.4 -0.028 0.3846 0.3722 0.6298 -0.4 -0.4 -0.028 0.3846 0.3722 0.6297 -0.4 -0.01 0.3352 0.7272 0.0229 0.1078 -0.028 0.3839 0.3721 0.6297		-0.40	00.0-	0.33		.7271	0.0230	0.108			3435	0.3717	0.6298	0.430
-0.4c -0.01 0.3352 0.7272 0.0228 0.1076 -0.0228 0.3846 0.3722 0.6297 -0.4c -0.01 0.3839 0.3721 0.6297		-0.40	-0.01	0.33		.7270	0.0230	801°0			3841	0.3723	0.6298	0.432
-0.46 -0.01 0.3353 0.7272 0.0229 0.1078 -0.0228 0.3839 0.3721 0.6297		-0.4c	10.0-	6.33		.7272	0.0228	0.107			3449	0.4722	0.6297	0.430
		-0.40	-0.01	0,33		.7272	0.0229	0.107			3636	0.3721	0.6297	0.433

	CLM CLN CLN CLN CLN	CLM CX CLN CLL CAT 49 0.8338 6.0167 0.6577 -0.0061 0.3891	CLM CX CLN CLL CAT 0.8338 0.0167 0.0577 -0.0161 0.3891 0.8342 0.0167 0.0579 -0.0060 0.388/	CLM CX CLN CLI, CAT 0.8338 0.0167 0.0577 -0.0061 0.3891 0.0167 0.0579 -0.0060 0.3881	CLM CX CLN CLL CAT 0.8338 0.0167 0.0577 -0.0161 0.3891 0.8342 0.0167 0.0579 -0.0060 0.388/9 0.0538 0.0185 0.0570 -0.0061 0.3890	CLM CLN CLN CLL CLN CLL CAT 0.8338 0.0167 0.0577 -0.0061 0.3891 0.8342 0.0167 0.0579 -0.0060 0.388/ 0.0579 -0.0001 0.3890	CLM CX CLN CLL CAT CLL CAT 0.8338 0.0167 0.0577 -0.0061 0.3891 0.8342 0.0167 0.0579 -0.0060 0.388/9 0.8338 0.0185 0.0575 -0.0060 0.3892	CLM CLN CLN CLL CLL CAT CLL CAT CLL CAT 0.8318 0.0167 0.0577 -0.0161 0.3891 0.8342 0.0167 0.0579 -0.0160 0.3884 0.0185 0.0570 -0.0161 0.3890 1 0.8338 0.0166 0.0575 -0.0160 0.3892	CLM CX CLN CLL CAT CLL CAT 0.8338 0.0167 0.0577 -0.0061 0.3891 0.008342 0.0167 0.0579 -0.0060 0.3889 0.0579 0.0000 0.3889 0.008338 0.0185 0.0573 -0.0061 0.3892 0.008338 0.0166 0.0573 -0.0061 0.3892 0.008338 0.0166 0.0573 -0.0061 0.3892
 2	CLM CX CLM	CLM CX CLN 9 0.8338 0.0167 0.0577	CLM CX CLN 9 6.8338 6.0167 0.0577 1 0.8342 0.0167 0.0579	CLM CX CLN 9 0.8338 0.0167 0.0577 1 0.8342 0.0167 0.0579	CLM CX CLN 9 6.8338 0.0167 0.0577 1 0.8342 0.0167 0.0579 9 0.8338 0.0165 0.0570	CLM CX CLN 9 0.8338 0.0167 0.0577 1 0.8342 0.0167 0.0579 9 0.8338 0.0185 0.0570	CLM CX CLN 9 0.8338 0.0167 0.0577 1 0.8342 0.0167 0.0579 9 0.8338 0.0185 0.0570 1 0.8338 0.0166 0.0575	CLM CX CLN 9 0.8338 0.0167 0.0577 1 0.8342 0.0167 0.0579 9 0.8338 0.0185 0.0570 1 0.8338 0.0185 0.0575	CLM CX CLN 9 0.8338 0.0167 0.0577 1 0.8342 0.0167 0.0579 9 0.8338 0.0185 0.0579 9 0.8338 0.0166 0.0575
	- 100 C	9 0.8338 0.0167 0.0577 -0.0061 0.3891	9 0.8338 0.0167 0.0577 -0.0060 0.3891 1 0.8342 0.0167 0.0579 -0.0060 0.388/	9 0.8342 0.0167 0.0577 -0.0061 0.3891 1 0.8342 0.0167 0.0579 -0.0060 0.3881	9 0.8338 0.0167 0.0577 -0.0061 0.3891 1 0.8342 0.0167 0.0577 -0.0060 0.388/ 9 0.8338 0.0185 0.0570 -0.0061 0.3890	9 0.8338 0.0167 0.0577 -0.0061 0.3891 1 0.8342 0.0167 0.0579 -0.0060 0.3881 9 0.8338 0.0185 0.0570 -0.0081 0.3890	9 0.8338 0.0167 0.0577 -0.0061 0.3891 1 0.8342 0.0167 0.0579 -0.0060 0.3881 1 0.8338 0.0185 0.0570 -0.0081 0.3890 1 0.8338 0.0166 0.0575 -0.0060 0.3892	9 0.8338 0.0167 0.0577 -0.0061 0.3891 1 0.8342 0.0167 0.0579 -0.0060 0.3881 9 0.8338 0.0165 0.0570 -0.0061 0.3890 1 0.8338 0.0166 0.0575 -0.0060 0.3892	9 0.8338 0.0167 0.0577 -0.0061 0.3891 9 0.8342 0.0167 0.0579 -0.0060 0.3884 9 0.8338 0.0185 0.0570 -0.0081 0.3890 1 0.8338 0.0166 0.0575 -0.0060 0.3892 9 0.8338 0.0166 0.0573 -0.0061 0.3892

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PACE	AEDC DIVISION VON KARMAN GA ARNOLD AIN 20 HOLLOMAN KOCK PAGE 1	AEDC DIVISION VON KARMAN GAS DYNAMI ARNOLD AIN YORCE STAT HULLONAN KOCKET SLED PAGE I		CS FACILITY 10n, Tennessee	<u> </u>					+0+4	TIME COMPUTED DATE RECORDED TIME RECORDED PROJECT NUMBER	~ ~	10:17:19 6-MAY-87 5:19:29 VA-37
RUN B	N CUDE	4.52	PT 108.74	11 579.7	5.241	p 0.366	T 114.0	RE 0.696E+07	7. 8.289		REF LENGTHS(CLM,CLN,CLL) 3.00u 2.200 2.200	S(CLM,CL 2,200	N,CLL)
1,3	CONFIG 1.3.2.2.2.W4	υ ‡					TRIP 0.025		•				
					i	TUNNEL	CUNDITI	TUNNEL CUNDITIONS, BASE	PRESSURES	RES			
2	ALPI	PHII	14	1	9	a. }	CPBA		PBA/P	PB1/P	P82/P	P83/P	
→ ~		-0.0-	106.40		5,225	0.365	-0.0278	0.0252	0.6017	0.5756	0.4159	1.0278	0,3876
~	40°0-	-0.01	164,42		5.216	0.365	-0.0278		0,6023	0.5747	0,4161	1,0309	
+	40.0-	-0.01	108.47		5.228	996.0	-6.0278		0.6028	0.5753	0.4170	1.0323	
n	•0.0	-0.01	106,52	578.7	5.230	0,366	-0.0278		0.6021	0.5750	0.4168	1,0299	
							BODY	AXES					
9		PHI	ö		M7 0	ວ	CLX	272		CAT	CA	NCP/LM	YCP/LM
-					.7202	0.0202	0.0732				0.3290	0.6258	0,5532
~					7205	0,0199	0.0722				0.3292	0,6258	
m	50.9-	-0.02			0.7204	0.0200	0.0726				0.3292	0,6259	
~					7206	0,0199	0.0722				0,3292	0.6258	
K)	-0.09	-0.02	0.3284		7203	0,0291	0.0726			0,3545	0.3293	0.6259	

DATE COMPUTE

CAL VED THUR TACE	CALSPAN JRPONATION AEDC DIVISIUM VON NARMAN GAS DYNAMICS FACILITY VAN NARMAN GAS DYNAMICS FACILITY ARNOLD MIN FOPCE STATION, TENNESS HOLLOMAN KOCKET SLED	JRPOHATION SION N GAS DYNA N FUPCE ST KOCKET SEE	N AMICS FA Tation, ED	CILITY Tennesse	ند نو						a + a + a	DATE COMPUT. TIM: COMPUTED DATE RECORDED TIME RECORDED PROJECT NUMBER		9-JUN-01 10:17:56 6-MAX-07 5:46:19 Y-18-37	
80 A	N CUDE 9 2	S. C6	PT 143.83	TT 656.7	4.544	P 0.254	T. 108.9	RE 0.577E+07		%	ef Lengths 3.000 2	REF LENGTHS (CLM, CLN, CLL)	2,200		
1.3	CONFIG 1.3.2.2.2.W4	🛫					TR12								
					i	TUNNEL		CUNDITIONS, BASE PRESSURES	E PRESSU	RES					
2 2	ALPI	PH11	4	£	Œ	3 <u>.</u>	CPBA	CABT	PBA/P	P81/P			P84/P		
- 0	40.04	0.0	163.83	666.7	4,544	0.254	-0.0188	0.0170	0.6634	0.6221	0.4542	1.1703		 -	
. ~	2	00	143.77	667.7	4.542	0,253	-0.03EB	0.0170	0.6637	0.6224				, ~1	
▼ :	40.0	-0.03	143,65	668.7	4.538	0,253	-0.0188	6.0170	3,6636	0.6203		1,1691	0.4076	٠	
so v	* o ·	-0.01	143.60	668.7	4,537		-5.0188	0.0170	9,6638	0,6205				33 0 (
۰ ۰	2 2	0.0	143.51	669.7	4.534		-0.0187	9.0169	0.0000	0.6209	C.4579		0.4080	\$	
- 30	20.0	-0.01	143.47	669.7	4.533	0.253	-0.03m7	0.0170	0.0645	0.6211			0,4081	٠.	
							FT- BODY	AXES	•						
a.	•	PHI			RUN GEN	CX	NJO,				5	MCP/LM	YCP/LH		FOUL
~ ~	0.0	-0.02	0.3702		0.8323	0.0260	30K0*0	0.00.0			0.3500	0.6175	0.5446	, .0	
•		-0.02	ဝ		8324	0.0257	0.0950				0.3501	0,6175	0.5450	•	
₩ (-0.03	0		0.8341	0.0265	0.0981				0.3499	0,6168	0.5447	1	
so ,	0	10.02			8347	0.0261	0.0961				0.3501	0,6166	0.5472	8 1	
o ~	 C :	70.0-), W347	0,0253	6,0975				0.3503	0.6166	0,5442	.	
~ JE)	70.01	• c)	2 4 5 2	6.020.0 0.050	40000	4 -0.00 <i>1</i> 2		26.72	0.3502	0.0163	0.04/0	9 1	
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FUN CUDE H FI TT 0 P T FKE 10	A VOICE HOLE	CALSPAN JAFU AEDC DIVISIUN VON KAHMAN GA ARNULO AIN FU HUELOMAN HOCK	CALSPANHURAFION AEDC DIVISION VON KAMMAN GAS DYNAMICS FACILITY ARNULO AIM FURCE STATIUM, TENNESSEE HOLLOMAN HOCKET SLED	N AMICS FA Tafium, Ed	JCS FACILITY Tium, Tennessi	a					DATE TIME TIME PROJE	DATE COMPUT. TIME COMPUTED DATE RECONDED TIME: RECONDED PROJECT NUMBER	C 1 2 2 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	C 0 C C
3.2.2.2.** 3.2.2.2.** 3.2.2.2.** 3.2.2.2.** ALPI PHII PI TT Q P CPBA CABT F CAUDO CONDUCTORNS, BASK CAUDO CONDUCTORNS, BASK CAUDO CONDUCTORNS, BASK CAUDO CONDUCTORNS, BASK CAUDO CONDUCTORNS, CAUDO CONDU				P.I. 61.02	TT 681.7	1,389			KE 0.194E+(A F0		REF LENGTHS(CLM,CLN,CLL) 3.000 2.200 2.200	S(CLM,CLN,	2.200
ALP1 PHII PI TT 0 P CP6A CABT P C-0.02 -0.011 0.0100 C-0.02 -0.05 -0.011 0.0100 C-0.02 C-0.05 -0.011 0.0100 C-0.02 C-0.05 C-0.011 0.0100 C-0.02 C-0.02 C-0.01 0.0100 C-0.02 C-0.01 0.0100 C-0.02 C-0.011 0.0100 C-0.02 C-0.01 0.0100 C-0.02 C-0.011 0.0100 C-0.02 C-0.01 0.0000 C-0.0000 C-0.0	1,3	CUNF.1	ب • د					TRIP 0.025						
ALP1 PHII PI TT Q P CPbA CABT PBA/6 -0.02 -0.01 61.02 b81.7 1.389 0.066 -0.0111 0.0101 0.765 -0.02 -0.00 61.11 681.7 1.389 0.066 -0.0111 0.0101 0.765 -0.02 -0.01 61.05 681.7 1.389 0.066 -0.0111 0.0100 0.765 -0.02 -0.01 61.05 681.7 1.389 0.066 -0.0111 0.0100 0.765 -0.02 -0.01 61.05 681.7 1.389 0.066 -0.0111 0.0100 0.765 -0.02 -0.01 61.05 681.7 1.389 0.066 -0.0111 0.0100 0.765 -0.02 -0.01 61.05 681.7 1.389 0.066 -0.0111 0.0100 0.765 -0.02 -0.01 61.05 681.7 1.389 0.066 -0.0111 0.0100 0.765 -0.20 -0.01 0.3499 0.7954 0.0243 0.0915 -0.0061 -0.20 -0.00 0.3498 0.7958 0.0243 0.0916 -0.0061 -0.20 -0.01 0.3503 0.7958 0.0243 0.0917 -0.0060 -0.20 -0.01 0.3503 0.7958 0.0243 0.0919 -0.0061 -0.20 -0.01 0.3503 0.7958 0.0243 0.0919 -0.0061 -0.20 -0.01 0.3503 0.7958 0.0243 0.0919 -0.0061 -0.20 -0.01 0.3503 0.7958 0.0243 0.0918 -0.0061						i	-TUNNE	L CUMPITI	ONS, BASE	PRESSURES	RES			
ALPHA PHI CN CLM CLM CLM CLM CLM CN CLM CN	7	AEP 1	PHII	ā	11	œ	۵.		CABT	PBA/P	P61/P		PB3/P	P64/P
-0.02 -0.00 bi.11 bki.7 i.391 0.066 -0.0110 0.0100 0.765 -0.02	- ~	0°00-) 0 0 0	61.02	581.7	1,389	0.066		0.0100	0.7659	0.6403	5084	1.4642	0.4505
-0.02	~	-0.62	00.0-	61.11	DH1.7	1.391	0.066		0.0100	0,7672	0.0393		1,4723	0.4498
-0.02 -0.01 bl.06 681.7 1.390 0.066 -0.0111 0.0100 0.765 -0.02 -0.00 bl.05 681.7 1.389 0.066 -0.0111 0.0100 0.765 -0.02 -0.01 bl.05 681.7 1.389 0.066 -0.0111 0.0100 0.765 -0.02 -0.01 bl.05 681.7 1.389 0.066 -0.0111 0.0100 0.765 -0.05 -0.0111 0.0100 0.765 -0.05 -0.	*	30.0-)n.)	61.10	681.7	1,391	0.066		0.0100	0.1614	0.0354		1,4725	0.4499
-0.02 -0.01 61.05 681.7 1.389 0.066 -0.0111 0.0100 0.76: -0.02 -0.01 61.05 681.7 1.389 0.066 -0.0111 0.0100 0.76: -0.20 -0.01 0.3497 0.7948 0.0243 0.0915 -0.0061 -0.20 -0.01 0.3500 0.7948 0.0243 0.0915 -0.0061 -0.20 -0.01 0.3509 0.7954 0.0243 0.0916 -0.0061 -0.20 -0.01 0.3509 0.7954 0.0243 0.0916 -0.0061 -0.20 -0.01 0.3509 0.7954 0.0243 0.0916 -0.0061 -0.20 -0.01 0.3509 0.7954 0.0243 0.0917 -0.0061 -0.20 -0.01 0.3509 0.7954 0.0243 0.0919 -0.0061 -0.20 -0.01 0.3509 0.7954 0.0243 0.0919 -0.0061	'n.	-0.03	-0.01	90.19	681.7	1.390	990.0	-0.0111	0.0100	0,7653	U.6398		1,4631	0.4502
-0.02 -0.01 61.05 681.7 1.389 6.066 -0.0111 0.0100 0.76: ALPHA PH1 CN CLM CY CLN CLN CLN CLL -0.20 -0.01 0.3497 0.7948 0.0243 0.0915 -0.0061 -0.20 -0.01 0.3499 0.7954 0.0243 0.0916 -0.0061 -0.20 -0.01 0.3499 0.7951 0.0243 0.0916 -0.0061 -0.20 -0.01 0.3503 0.7954 0.0243 0.0917 -0.0061 -0.20 -0.01 0.3503 0.7954 0.0243 0.0919 -0.0061 -0.20 -0.01 0.3503 0.7958 0.0243 0.0919 -0.0061	ا ۵	-0.02	00.0-	61,05	681.7	1.369	0.066	-0.0111	0.0100	0.7654	0.6399		1.4634	0.4503
ALPHA PH1 CN CLH CY CLN CLL CLL CLL CN.220 -0.01 0.3497 0.7948 0.0243 0.0915 -0.0061 -0.20 -0.01 0.3499 0.7954 0.0243 0.0916 -0.0061 -0.20 -0.00 0.3499 0.7951 0.0243 0.0917 -0.0061 -0.20 -0.01 0.3503 0.7954 0.0243 0.0917 -0.0060 -0.20 -0.01 0.3503 0.7958 0.0243 0.0919 -0.0060 -0.20 -0.01 0.3503 0.7958 0.0243 0.0919 -0.0060 -0.20 -0.01 0.3503 0.7958 0.0243 0.0913 -0.0060	~,	-0.02	-0-01	50.14	681.7	1,389	990°3	-0.0111	0.0100	0.7655	0.6359	0.5081	1,4635	0.4503
ALPHA PHI CN CLM CY CLN CLL CO.20 -0.01 0.3497 0.7948 0.0243 0.0915 -0.0061 -0.20 -0.01 0.3500 0.7948 0.0243 0.0915 -0.0061 -0.20 -0.00 0.3499 0.7954 0.0242 0.0916 -0.0061 -0.20 -0.20 0.3499 0.7951 0.0243 0.0917 -0.0061 -0.20 -0.01 0.3503 0.7954 0.0243 0.0919 -0.0061 -0.20 -0.01 0.3503 0.7958 0.0243 0.0919 -0.0061 -0.20 -0.01 0.3503 0.7958 0.0243 0.0913 -0.0060														
ALPHA PH1 CK CLM CLM CLK CLLK CLK CLLK CLLK CLLK								HUDY	AXES	_				
-0.20 -0.01 0.3497 0.7948 0.0243 0.0915 -0.0061 -0.20 -0.20 0.3500 0.7954 0.0242 0.0916 -0.0060 -0.20 -0.20 0.3499 0.7951 0.0245 0.0923 -0.0061 -0.20 -0.50 0.3498 0.7951 0.0243 0.0917 -0.0060 -0.20 -0.01 0.3563 0.7948 0.0243 0.0917 -0.0060 -0.20 -0.01 0.3563 0.7958 0.0243 0.0919 -0.0061 -0.20 -0.01 0.3503 0.7958 0.0243 0.0919 -0.0060 -0.20 -0.20 -0.01 0.3503 0.7958 0.0243 0.0913 -0.0060	2,		144	Š		 	C	370	170		CAT	.	NCP/LM	YCP/LH
-0.20 -0.01 0.3500 0.7954 0.0242 0.0916 -0.0060 -0.20 -0.20 0.3499 0.7951 0.0245 0.0923 -0.0061 -0.20 -0.20 -0.50 0.3498 0.7951 0.0243 0.0917 -0.0060 -0.20 -0.01 0.3503 0.7957 0.0243 0.0919 -0.0060 -0.20 -0.01 0.3503 0.7958 0.0243 0.0918 -0.0060 -0.20 -0.01 0.3503 0.7958 0.0243 0.0918 -0.0060	- (10.0	0.34			0.0243	٠			0.3624		0.6137	0.5373
-0.20 -0.00 0.3498 0.7931 0.0443 0.0923 -0.0060 -0.20 -0.20 0.3498 0.7948 0.0043 0.0917 -0.0066 -0.20 -0.01 0.3563 0.7957 0.0243 0.0919 -0.0060 -0.20 -0.01 0.3503 0.7958 0.0243 0.0918 -0.0060 -0.20 -0.20 0.0918 -0.0060	7 ~		000	35.0			0.0242				0.3627		0,6137	0.5360
-0.2u -0.01 0.3503 0.7957 0.0245 0.0919 -0.0061 -0.2u -0.01 0.3503 0.7958 0.0243 0.0918 -0.0060 -0.2u -0.01 0.3509 0.7958 0.0243 0.0913 -0.0060	, 4		000	44.			0.0243				0,3621	0.3521	0.013/	0,000
-0.2v -0.01 0.35v3 0.7958 0.0243 0.0918 -0.0060 -0.2v -0.01 0.3499 0.7947 0.0243 0.0913 -0.0061	S		10.0	30.0			0.0245				2000	35.25	6138	10000
-0.20 -0.61 0.3499 0.7947 0.0243 0.0913 -0.0061	٠		-0.01	0.35		7958	0.0243	160.7			0.3031	2.353.5	0.6138	24.4
	7		-0.01	0.34		7947	0.0243	160.0			0.3025	0.4525	0.6138	0.5382
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TATE	AEDC U VON KA ARNULU HOLLUM	R A A A A A	SION N CAS DYNA H FORCE ST HOCKET SLE	108 110	FACILITY *, TENNESSEE	لىد					DATE TIME TIME PROJE	VATE COMPUTE, TIME COMPUTED DATE RECURDED TIME RECORDED PROJECT NUMBER	9-cdn-67 D 10:20:2: D 0-HAY-87 D 22:44:23	7337:
3.2.2.2.MID TUNNEL CUNDITIONS, BASE PRESSURES ALP1 PHI1 PL TT 0 P CPBA PBA2P PBA2P PBA3P 0.02 -0.01 111.61 573.7 5.379 0.475 -0.026 0.0442 0.00642 0.4441 1.1349 0.02 -0.01 111.42 573.7 5.379 0.475 -0.026 0.0442 0.0664 0.4441 1.1349 0.01 -0.01 111.14 574.7 5.355 0.474 -0.0249 0.0226 0.0441 0.006 0.4346 1.1372 0.01 -0.01 111.10 574.7 5.355 0.474 -0.0249 0.0226 0.0441 0.006 0.4341 1.1473 0.01 -0.01 111.10 574.7 5.355 0.474 -0.0249 0.0226 0.0441 0.0067 0.4344 1.1426 0.01 -0.01 111.07 574.7 5.353 0.374 -0.0249 0.0226 0.0441 0.0067 0.4344 1.1426	RUN 12	CUDE	E 4.	P. 111.01	TT 573.7	5.379	P 0.376	T 112.8	RE 0.725E+			LENGTHS (CEM,CLM	CTT)
ALFI PHII PI TT Q CRBT CABT PRAZE PRESSURES=== 0.02 = 0.01 111.61 573.7 5.379 0.476 -0.0246 0.0226 0.0432 0.0074 0.4341 1.1389 0.02 = 0.01 111.42 573.7 5.379 0.475 -0.0249 0.0226 0.0441 0.0074 0.4341 1.1389 0.02 = 0.01 111.28 573.7 5.354 0.475 -0.0249 0.0226 0.0441 0.0073 0.4353 1.1403 0.01 = 0.01 111.10 574.7 5.355 0.474 -0.0249 0.0226 0.0441 0.0073 0.4353 1.1403 0.01 = 0.01 111.07 574.7 5.353 0.474 -0.0249 0.0226 0.0441 0.0077 0.4344 1.1426 1.02 = 0.01 111.07 574.7 5.353 0.474 -0.0249 0.0226 0.0441 0.0077 0.4344 1.1426 1.02 = 0.01 111.07 574.7 5.353 0.474 -0.0249 0.0226 0.0441 0.0077 0.4344 1.1426 1.040 = 0.02 0.3542 0.8491 0.0229 0.0805 0.3867 0.3440 0.5945 2.040 = 0.02 0.3547 0.8500 0.0225 0.0792 -0.0061 0.3867 0.3440 0.5945 3.040 = 0.02 0.3547 0.8500 0.0225 0.0792 -0.0061 0.3866 0.3440 0.5944 0.040 = 0.02 0.3540 0.8500 0.0225 0.0792 -0.0061 0.3866 0.3441 0.5942 0.040 = 0.02 0.3540 0.8500 0.0225 0.0796 -0.0061 0.3866 0.3441 0.5942	1.3.	CONFIG 2.2.2.41	٥					141P 0.025						
ALPH PHII Pr TT 0 PPAAP CABT PRAZE 0.6074 U.4341 1.1389 U.02 -0.01 111.61 573.7 5.379 0.475 -0.0226 U.0432 0.6074 U.4341 1.1389 U.02 -0.01 111.42 573.7 5.379 0.475 -0.0226 U.0429 0.0226 U.06432 0.6074 U.4341 1.1389 U.03 -0.01 111.28 573.7 5.355 0.475 -0.0226 U.0457 0.0079 U.4353 1.1403 U.04 -0.00 111.10 574.7 5.353 U.374 -0.0249 U.0226 U.06441 U.0607 U.4344 1.1426 U.04 -0.01 111.07 574.7 5.353 U.374 -0.0249 U.0226 U.06441 U.0607 U.4344 1.1426 U.04 -0.02 U.3542 U.8491 U.0229 U.0845 U.0641 U.367 U.3441 U.3694 U.04 -0.02 U.3542 U.8491 U.0229 U.0845 -0.0061 U.367 U.3441 U.3694 U.04 -0.02 U.3546 U.8500 U.0225 U.0793 -0.0061 U.3657 U.3440 U.35942 U.04 -0.02 U.3547 U.8500 U.0225 U.0793 -0.0061 U.3650 U.3441 U.36942 U.04 -0.02 U.3547 U.8500 U.0225 U.0793 -0.0061 U.3650 U.3441 U.36942 U.04 -0.02 U.3547 U.8500 U.0225 U.0793 -0.0061 U.3650 U.3441 U.3994						•	-TUNNEL	CUNDITI	ONS, BAS	F PRESSU	RES			
0.02 -0.01 111.61 573.7 5.379 0.376 -0.0245 0.0226 0.0432 0.6074 0.4341 1.1389 0.02 -0.01 111.42 573.7 5.370 0.375 -0.0250 0.0226 0.04429 0.05050 0.4346 1.1372 0.01 -0.01 111.28 573.7 5.354 0.374 -0.0249 0.0225 0.06441 0.6067 0.4346 1.1473 0.01 -0.01 111.01 574.7 5.353 0.374 -0.0249 0.0225 0.6441 0.6067 0.4340 1.1477 0.01 -0.01 111.07 574.7 5.353 0.374 -0.0249 0.0225 0.6441 0.6067 0.4340 1.1426 0.01 -0.01 111.07 574.7 5.353 0.374 -0.0249 0.0226 0.6441 0.6067 0.4344 1.1426 0.40 -0.02 0.3542 0.8491 0.0229 0.0805 0.3667 0.3667 0.3441 0.5941 0.40 -0.02 0.3546 0.8500 0.0225 0.0792 -0.0061 0.366 0.3440 0.5942 0.40 -0.02 0.3546 0.8500 0.0225 0.0792 -0.0061 0.366 0.3441 0.5941 0.40 -0.02 0.3546 0.8504 0.0225 0.0796 -0.0061 0.3660 0.3441 0.5941	٣ ٣	ALFI	PHI1	P.F.	TT	9	<u>م</u>	CPBA	CABT	PRA/P	P81/P	P82/P	P83/P	P84/P
0.02 -0.01 111.28 573.7 5.370 0.475 -0.0250 0.0226 0.6429 0.6060 0.4346 1.1372 0.402 -0.01 111.28 573.7 5.354 0.435 -0.0248 0.0225 0.6457 0.60673 0.4350 1.1477 0.401 -0.00 111.10 574.7 5.355 0.474 -0.0248 0.0225 0.6457 0.6066 0.4360 1.1477 0.401 -0.01 111.07 574.7 5.353 0.4374 -0.0249 0.0225 0.641 0.6007 0.4344 1.1426 0.41 0.601 111.07 574.7 5.353 0.4374 -0.0249 0.0226 0.641 0.6641 0.6007 0.4344 1.1426 0.464 0.402 0.402 0.404 0.404 0.404 0.002 0.404 0.404 0.404 0.002 0.002 0.3545 0.8491 0.022 0.002 0.0061 0.3667 0.3441 0.5945 0.40 -0.02 0.3546 0.8502 0.0225 0.0793 -0.0061 0.3666 0.3441 0.5942 0.40 -0.02 0.3546 0.3546 0.022 0.022 0.0796 -0.0061 0.3666 0.3441 0.5941 0.5941 0.40 -0.02 0.3546 0.3546 0.022 0.022 0.0796 -0.0061 0.3666 0.3441 0.5941 0.5941		0.02	-0.01	111.61	573.7	5.379		-0.6249	0.0226	0.6432	0.6074		1,1389	0.3925
0.02 -0.01 111.28 573. 5.354 0.375 -0.0249 0.0226 0.5441 0.6073 0.4353 1.1403 0.01 -0.01 111.02 574.7 5.355 0.374 -0.0249 0.0225 0.6457 0.6066 0.4350 1.1477 0.01 -0.01 111.07 574.7 5.353 0.374 -0.0249 0.0226 0.6441 0.6067 0.4344 1.1426 0.601 -0.01 111.07 574.7 5.353 0.374 -0.0249 0.0226 0.6441 0.6067 0.4344 1.1426 0.46 -0.02 0.3542 0.8491 0.0229 0.0845 -0.0061 0.3657 0.3441 0.5944 0.46 -0.02 0.3546 0.8597 0.0225 0.0795 -0.0061 0.3650 0.3440 0.5944 0.46 -0.02 0.3546 0.8502 0.0225 0.0796 -0.0061 0.3660 0.3440 0.5944 0.46 -0.02 0.3546 0.8504 0.0227 0.0805 -0.0061 0.3660 0.3441 0.5941	~	0.02	10.0-	1111.42	573.7	5.370		-0.0250	0.0226	0.6429	0.6066		1,1372	0.3931
U.UI -0.00 111.10 574.7 5.355 0.374 -0.0248 0.0225 0.6457 0.6066 0.4350 1.1477 U.UI -0.01 111.07 574.7 5.353 0.374 -0.0249 0.0226 0.6441 0.6067 0.4344 1.1426 1.1426 0.441 0.6067 0.4344 1.1426 0.441 0.6067 0.4344 1.1426 0.441 0.	~,	60°0	0.0	111.28	573.	5.364		-0.0249	0.0226	0.6441	0.6073		1,1403	0.3936
U_cUI =0.01 111.07 574.7 5.353 U_374 =0.0249 U_0226 U_6441 U_6007 U_4344 1.1426 ———————————————————————————————————	+	10.0	00.0-	111,10	574.7	5,355		-0.0248	0.0225	0.6457	0.0006		1,1477	0.3925
*** *********************************	'n		-0.01	111.07	574.7	5,353		-0.0249	0.0226	0.6441	6.6067		1,1426	0.3920
ALPHA PHI CN CLM CLN CLL CAT CA NCP/LM 0.46 -0.02 0.3542 0.8491 0.0229 0.0805 -0.0061 0.3567 0.3441 0.5943 0.46 -0.02 0.3545 0.8497 0.0225 0.0793 -0.0061 0.3567 0.3440 0.5945 0.46 -0.02 0.3547 0.45500 0.0225 0.0796 -0.0061 0.3566 0.3440 0.5944 0.46 -0.02 0.3546 0.48502 0.0225 0.0796 -0.0061 0.3566 0.3441 0.5942 0.46 -0.02 0.3546 0.48504 0.0227 0.0805 -0.0061 0.3566 0.3441 0.5941														
ALPHA PHI CK CLM CM CM <td></td> <td>•</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td> Euby</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>		•						Euby						
0.46 -0.02 0.3542 0.8491 0.0229 0.0805 -0.0061 0.3667 0.3441 0.5943 0.46 -0.02 0.3546 0.8497 0.0225 0.0793 -0.0061 0.3667 0.3440 0.5945 0.46 -0.02 0.3547 0.8500 0.0223 0.0792 -0.0061 0.3666 0.3440 0.5944 0.46 -0.02 0.3546 0.8502 0.0225 0.0796 -0.0061 0.3666 0.3441 0.5942 0.46 -0.02 0.3546 0.8504 0.0227 0.0805 -0.0061 0.3666 0.3441 0.5941	3	ALPHA	PHI	S		F.1	CX	CLN	์ เ	د	CAT	č	NCP/LM	YCP/LM
0.46 -0.02 0.3546 0.8497 0.0225 0.0793 -0.0061 0.3667 0.3440 0.5945 0.46 -0.02 0.3547 0.8500 0.0223 0.0792 -0.061 0.3666 0.3440 0.5944 0.46 -0.02 0.3546 0.8502 0.0225 0.0796 -0.0061 0.3666 0.3441 0.5942 0.46 -0.02 0.3546 0.8504 0.0227 0.0796 -0.0061 0.3666 0.3441 0.5941		0.40	-0.02				0.0229	0.080				0.3441	0.5943	U.5664
0.40 -0.02 0.3547 0.8500 0.0223 0.0792 -0.0061 0.3666 0.3440 0.5944 0.46 -0.02 0.3546 0.8502 0.0225 0.0796 -0.0061 0.3666 0.3441 0.5942 0.40 -0.02 0.3546 0.8504 0.0227 0.0805 -0.0061 0.3666 0.3441 0.5941	7	0.40	-0.02				0.0225	0.079				0.3440	0.5945	0.5055
0.46 -0.02 0.3546 0.8502 0.0225 0.0796 -0.0061 0.3666 0.3441 0.5942 0.46 -0.02 0.3546 0.8504 0.027 0.0805 -0.0061 0.3566 0.3441 0.5941	~	0.40	-0.02				0,0223	6.019				0.3440	0.5944	0,5523
0.4c -0.02 0.3546 0.8504 0.0227 0.0805 -0.0061 0.366c 0.3441 0.5941	•	0.46	-0.02				0.0225	0.079				0.3441	0.5942	0.5630
	s	0.40	-0.02				0.0227	0.080				0.3441	0.5941	0.5635

9-JUN-67 10120133 6-KAK-87 231 2114 VA-37	,CLL) 2,200			P84/P	0.3655	0.3692	0.3674	0.3690	0,3690		XCP/LM	0.5677	0.5707	0,5716	0.5724	1,5722	0.5725
	REF LENGTHS(CLM,CLN,CLL) 3.u0u 2.200 2.200			PB3/P	1.1132	1117	1.1116	1.1071	1.1071		MCP/LM	0.5963	0,5956	0,5957	0.5956	0.5957	0.5956
DATE COMPUT. TIME COMPUTED DATE RECORDED TIME RECORDED PROJECT MUMBER	LF LENGTHS(r82/p	9614.0	PE 14 ::	c. 4139	0.4136	u.4136		₹	0.3382	0.3383	u. 3382	0.3382	0.3381	0.3382
			S	P81/P	0.5896	- Cada	1.5897	0.5893	0.5893		CAT						
	A 8.289		ESSUR		0.6205				0.6197		3	0.3625	0.3624	0,36	0.30	0.30	0,3625
	RE U.710E+07		BASE PH							ţ	CLL	-6.0057	-0.0056	-0.0056	-0.0056	4500.0-	-0.0056
			SNO	CABT	0.0241	0.0240	0.0240	0.0241	0.0241	AAES	•						
	112.6	TRIP 0.925	TUNNEL CUNDITIONS, BASE PRESSURES	CPBA	-0.0265	5470.00	-0.0265	-0.0266	-0.0266	60by	SCN	0.0767	0.0757	0.0757	0.0757	6.0756	0.0756
	P 0.367		-TUNNEL			707 0				•	CX	0,0219	0.0218	0,0218	0,0219	0.0218	0.6219
ن	5,250		1	o	5,250	5 240	5.249	5,253	5,253		CLM	0.7468	0.7486	7474	0,7475	0.7477	0,7479
FACTLITY 1, TEHNESSEE	572.7			11	572,7	7 575	512.7	572,7	572.7		U						
ICS IION	PT 108,92			PI	108.92	10 x 01	36.801	86.891	104.98		S	0.3132	0.31	0,31	0,31	0.31	0.31
UKATION JA JAS PYNE JACE ST CKET SLE	4.52	و		PH11	10.01	20.00	0.0	-0.01	-0.03		PH	-u.02	-0.05	-0.02	-0.02	-0.02	70.0-
CALSPAN JAPUKATION AEUC DIVISION VON KARMAN GAS DYNAMICS ARNOED AIM PORCE STATION MOLEGMAN ROCKET SLED	CUDE 3	CUNFIG 1.3.2.2.2.W16		ALP1				0.02	0.02		ALPHA	90.0	4 0.0	0.0	0.04	*0.0	40.0
CALSPA AEUC U VON KA ARNULU HOLLOM PAGE 1	RUN 13	1.3.		S.	, (4 -	1 4 *	s	٥		3	_	~	~	*	s	•

9-JUN-87 10:20:47 6-MAY-87 23:27:49 YA-37	,CLL)			PB4/P	0.3850	0.3824	6.3814	0.3807		YCP/LA U.5648 U.5648 U.5650 U.5644 U.5625
	REF LENGTHS(CLM.CLM,CLL)			PB3/P P				1,4251 0		2000 2000 2000 2000 2000 2000 2000 200
DATE COMPUT. TIME CUMPUTED DATE RECOKDED TIME RECORDED PHOJECT MUMBER	LENGTHS (C			1 B2/P	0.4718	6.4727	u.4767	0.4759		00 00 00 00 00 00 00 00 00 00 00 00 00
			it.S	P31/P	0.0377	0.63/0	0.0360	0.6369		0.3710 0.3710 0.38695 0.38695 0.38695
	A 4.289		PRESSUR	PBA/P	0.7222	0,7255	0,1296	0.7295		
	RE 0.566E+07		IS, BASE	CABT				0.0137 (IXES	CLL +0.0055 -0.0006 -0.0066
	T.109.1	FK1P 0.025	TUNNEL CONDITIONS, BASE PRESSURES	CPBA				-0.0151	BODY AXES	CLN 0.0855 0.0858 0.0855 0.0855
•	P 0.251		-TUNNEL	9 25 1				0.252	i	0.0242 0.0242 0.0243 0.0244 0.0244
w	4.507		;	A 40.7	4.455	4,497	4.509	4.517		CLN 0.8618 0.8616 0.8597 0.8597 0.8552
FACILITY N. TERNESSEE	TT 671.7			TT 671.7	F.bB.7	654.7	1.650	655.7		
MICS FAC	FF 142.67			P.F. 147. h7	141.00	142,34	142,11	142.97		0.3609 0.3609 0.3509 0.3598 0.3598
COPPORATION LISIUN AM GAS DYNA LIM FURCE ST	5.06	9		11110	10.0	10.0	ŋ 0° 0	0.0		11.000000
z m ž ~ ž	CUDE	CONFIG 1.3.2.2.2.216		ACPI	0.0	60.0	0°03	e o .		ALPHA 00000111 000111 00111
CALSPA AEDC D VON KA ARNOLD HULLOM	RUN 14	1.3.		* ~	~	~	≠ (•		24 U M 4 N

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	CALSPA AEDC D VON KA AKNULD HULLOM PAGE 1	CALSPAN JUPORATION AEDC HIVISION VON KARMAH GAS DYNAMICE F ARNOLD AIM FURCE STAIION, HULLOMAN KOCKET SEED	PORATIUM UN GAS DYN FURCE S	102 F	actlity Tenhessee	ធ							DATE COMPUT. TIME COMPUTED DATE RECORDED TIME RECORDED PPOJECT KUNBER	9-JUM-87 10:21:10 7-MAX-87 UI46:48
	RUN	s Cube	3.51	PT 53,19	TT 592.7	u 5,930	9.0 9.0	17.11.1	RE 0.55£₽÷67		# 289 J	F LENGTHS	REF LENGTHS(CEM.CLF.CEL) 3.000 2.200 2,200	CLL3
	1,3,	CUNF16						. THIP 0.025						
						i	TUMBEL	TUNNEL CUNDITIONS, BASE PRESSURES	ONS, BAS	SE PRESSI	JRES			
_	э. Б.	ALPI	ITHd	H 3	1.	3	a. .	CPBA	CABT	PBA/P	9/184			9/4/9
	- ~	000		53.02	552.7	5.930	ر د ده ده	-0.0484	0.0439	0.5846	0,671	1 v.4152	0.6740	0.4366
	₹1	00.0	0.01	32,40	593.7	5,404		-0.0483	0.0438	0.5836				0.4365
	+	90.0•	0.61	54.85	543,7	5.892		-0.0443	U.043R	0.583.0				0.4384
	'n	00.0-	0.01	52,85	533.7	5,892	0.683	-0.0485	0.0440	0.5818				0.4364
	•	00.0	0.01	52.91	593.7	868.5	U.084	-0.0483	0.0438	0,5836	U.0083			0.4389
								BOUY	AXES	•				
	ď.	ALPHA	IHa	S		CLM	CX	C.EX	270	یہ	CAT	5	NCP/12M	YCP/LM
	-	0.13	0.01	0.30		0,7226	0.0136	C.0685	7		0,3/71	4, 4333	0.5964	0.3913
	~	0.13	0.01	0.34			0.0136	0.0689			7. £ £ £ 0	4, 1335	0.5964	0.3902
	~	0.13	0.01	0.30			0.0135	0.068			3771	0.3333	0.5962	0.3584
	~		0.01	0,30			0,0134	U.0682			0.3772	0.1334	6965.0	0.3867
	ß	0.13	0.01	0.3028		0.7221	0.0135	0.0668			0.3770	0.3330	0,3963	0.3856
	U	0.13	70.0	0,50		U.7224	0.0137	664B*n	3 -0.4017		4,3774	6.1334	0,5962	6,3845

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A PROPERTY	CELSPAN JRPHHATION AEDC DIVISIUN YON KARMAN GAS DYNAMICS FACILITY ARNOLD AIM FORCE STATION, TENNESSEE HOLLOMAN HOCKET SLED	JRPUHATION SIUN N GAS DYNA H FORCE ST HUCKET SLE	NHICS FA FATION, ED	FACILITY , TEANESSE	5 0					DATE COMPUT. TIME COMPUTED A15 RECURDED TIME RECURDED PROJECT NUMBER		10:21:29 7-MAX-67 1: 3:17 VA-37	
RUN Se	: 98 7002 NA	4.62	PT 69.07	TT 592.7	5.011	4.0 4.3	T 1 [40.0	RE U.549€+07		>	EF EENGTH 3.000	REF LLXGTHS(CLK,CLN,CLL) 3.400 2.200 2.200	%,CLL) 2,200
1.3	CONFIG 1.3.2,2.2.						TK1P 0.025						
					:	TURNEL	. CUMDITI	CONDITIONS, BASE PRESSURES	SSTEE S	RES			
æ. •	ALPI	ILHO		7.1	G,	-2v ·		CABT	PBA/P	P81/P			
- -	00.0	0.0	64	592.7		C. 44.3	-0.0332 -6.6334	0.0301	0.620.0	0.6370	0.4208	8 1.6034	
• ~	000	0.01	69,97	592.7	5.011	0.443	-0.6331	0.0300	0,625?	0.6370			
•#	-0.00	10.0-	69.06	591.7	5.010	0.443	-0.0331	0.0300	0.6255	0.0371			
S	00.0-	-0.01	10.69	591,7	5,006	0.443	-0.0330	0.0299	0,6267	6,4376			9 0.4391
Φ	00.0-	-0.01	69.14	591.7	5.016	0.443	-0.0331	0.0300	0.5259	0.0364			
									•	r			
							HODY AXES	AXES					
Z.	ALPHA	PHI	S		K I	CX	CLN	777	د.	CAT	₹:	MCF/LA	ICP/LA
***	0.00	-0.02	0.3261		0.7460	0.0146	0.0656	•		0,3503	0.1303	0.6119	0.4555
~) 0	-0.02	0,3261		0.7467	0.0146	0.0657			0,3602	0.4303	0.5110	0.4546
•		-0.02	0,3261		0,7466	0.0143	4.0654			0.3603	0.3303	0,6111	0.4544
•		-0.02	0,3262		0.7468	0.0140	0.0657			0,3603	0.3303	0.6110	0.4547
S		-0.62	0.32		0,7408	0.0145	0.0651			0,3501	0.3302	9,6110	0.4541
٥	20.0	-0.05	u. 3262		U.74n9	0.0145	4,0652			0,3603	6,5303	0.5110	0.4539

A PED C CALSE VERN L VE	CALSPAN APURATION AEDC DIVISION VON KARMAN GAS DYNAMICS FACTUITY ANNULD AIM FORCE STATION, TENNESSEE HULLOMAN MOCKET SLED	REURATION CON CAS DYN FORCE SICKET SE	ik IATIGHA ED	ncjejty Tenressi	 6:					3 1 2 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	DATE CUMPUT TIME CUMPUTED DATE RECURDED TIME RECURDED	Y-JUN-87 D 16:21:45 D 7-MAY-67 C 3:45:2	
RUN 17	TOW CUDE	A. 02	Pr 68.71	7f 584.7	4.984	P 0.441	T 1 138,2	RE U.557E¢97	A 07 8.289		REF LENGTHS(CLM,CLM,CLL)	S(CLM,CLN 2,200	,CLL) 2,250
1.3	CONFIG 1.3.2.2.2.44						FR1P 0.025						
					i	TURNE	TURNEL CONDITIONS,	ONS, BASE	E PRESSURES	RES			
32 · S.	ALPI	PHII	4	11	c	a.	CPBA	CABT	PBA/P	P81/P	F82/P	P83/P	724/5
-		0.0	66.73	584.7	4.984	0.441		2	0.5587	0,5302	4004	0.9042	0.4001
7 -		0.0	10 to	584.7	466	0.442			0.5578	0.5290	0.3994	0.9036	0.3991
า -	# : 0 :) (5 C	564.7	5.013	0.443	-0.0391		0.5575	0.5287	9666.0	0.9022	C. 3993
. ۳) (37° K Q	584.7	5.020	0.444	-0.0391		0.5582	0.5295	0.4000	0.9039	0.3987
n 4	7.00	000	27.69	584.7	5.022	0.444	-0.0390		0,5583	u.5293	0.4004	0.9036	0.4001
٦ ٥		00.0	£1.50	585.7	5.015	0.443	-0.0390		0.5591	u.5300	0.4010	0.9048	9009 0
•		00.0	70.40	585.7	5,011	0,443	-0.0391	0.0355	0.5573	U.5289	0.3998	0.9010	0.3994
							BUDY AXES	AXES					
ď	ALTHA	JHd	CN		CLM	CX	CLN	772		747	₹.	M.1/07W	YC0/12
	70.0	00.0-	6.3040		6.0673	0.0170	0.6724	1		38	7	0.6257	10.44.0
(%	0.02	-0.03	0.3039		0.6673	0,0171	0,0723					0.6256	0.4841
~) •	0.02	10.0-	0.3040		0,6675	6,0172	0.0727					0.6257	6845
• (70.0	0.0	0.3043		0,6679	0.0172	0.0726					0.6257	7 7 7 7 7
Λ,	0.02	10.01	1 TOTO		0.6676	0,0172	0.6728	-				0.6256	0.6853
۰ م	<u>.</u>	10.0-	0.3039		0.6672	u.0171	0.0725					0.6257	0.4834
-	20.0	-0.01	0.3039		0.6671	0,0172	0.0726					0.6256	0.4848
										•		•	

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CALSPAN AEUC DI VON KAR AKNULU HOLLOMA	CALSPAN APU AEDC DIVISIUN VON KARMAN GA ARNDLU AIN FU HOLLOMAN KOCK	CALSPAN APURATION AEDC DIVISIUN VON KARMAN GAS DYNAMICS ARNDLU AIN FURCE STATIO HOLLOMAN KOCKET SLED	MICS FAUTON, TATION, TO	FACILITY N, TENNESSEE	al 53		•			DATE TIME DATE TIME PROJE	DATE CUMPUT. TIME CUMPUTED DATE RECUMDED TIME RECUMDED PROJECT NUMBER	9-JUN-87 10:22:07 7-MAX-87 7-MAX-87 1 4: 4:31	667 C00 C00 C00 C00 C00 C00 C00 C00 C00 C0
X CN	CUDE	3.E	P1 52.49	TT 593.7	5.896	P 684	T 171.4	RE 0.547E+07		A REF 8.289 3.	REF LENGTHS(CLM,CLN,CLE) 3.uou 2.200 2.200	S(CLM,CLM,	,CLE)
1.3.	CONFIG 1.3.2.2.2.W4	*					181P 0.025						
					i	TURNEL	CUMDITA	TUHNEL CUNDITIONS, BASE		PRESSURES			
ą.	ALPI	PH 1 1	PT	1.1	3	۵.	CPBA	CART	PBA/P	P81/P		PB3/P	P84/P
- -	0.02	0-0-	52,89	593.7	968.5	4 4 4	-0.0545	0.0494	0.5296	6.5076	6 0.4263	0.7730	0.4115
• ~	0.02	000	52,48	563	900	0.685		0.0494	6.5302	0.5077		0.7747	0.4119
+	0.02	00,0	52,91	593.7	5.898	0.684	-0.0546	0.0495	0.5295	4.5064			0.4114
'n	0.02	00.0-	52,97	593,7	5.905	0.685	-0.0547	0.0496	0.5281	0.5068		0.7679	0.4119
								·					
							¥094	AXES					
S.	ALPHA	THA	S. C.		CLM	Č.	CLN			CAT	C.A.	MCP/LM	YCP/EM
- ~	0.0	0.01	0.2862		0.6508	0.0185	0.0000	0.0025		0.3855	u. 3361	0.6059	0.4386
~	0.05	10.0-	0.2800		0.6504	0.0187	0.0862			0.3853	0.4360	0,6059	0.4406
₩,	0.05	10.0-	0.2603	3 (0.6514	0.0187	980.0			0,3854	0.1360	0.6057	0.4397
r	0.	10.0-	0.2403	3	. 6513	0.0163	280.0	6700.0- 70		U. 3454	1658.0	0.600	1144.0

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CALSPA AEDC U VON KA ARNOLU HOLLOM	R E E E E E E E E E E E E E E E E E E E	JEPUKATION SIUN G GAS DYNA F FURCE ST KUCNFT SLE	NAMICS PA TATION, ED	CS FACILITY Ion, Tennessee	ıı.					DATE C TIME C DATE R TIME R PROJEC	DATE COMPUT TIME COMPUTED DATE RECONDED TIME RECORDED PROJECT NURBER	9-JUN-67 10:22:24 7-MAY-87 2:47: 0	
KUN 19	K CODE	3.51	P1 52,97	TT 591.7	ი გ. 905	P 0.c85	T 5 170.8	RE U.550E+07	A 07 8,289		Ref Lengths(CLM,CLM,CLL)	SICLM,CLW, 2,200 2	, CLL) 2, 200
1.3	CONF1G 1.3.2.2.2.116	16					frIP 0.025						
					;	-TUNNE	, CUNDITI	TUNNEL CONDITIONS, BASE PRESSURES	F PRESSU	RES			
7 \$	ALPI	PHII	ā	11		2	CPBA	CABT	PBA/P	PB1/F	PB2/P	PB3/P	F84/P
-	0.01	0°00	24.97	591.7	5,905	0.685	-0.0551	0.0500	0,5245	0.5264	0.3927	8011.0	U. 408G
? ·	0.01	00.0	54.63	541.7	5.912	089.0	-0.0552	0.0500	0.5243	0.5258		0.7709	6.4075
~	10.0	10.0	53.01	291.7	606.5	0.685	-0.0550	0.0498	0.5258	0.5260		0.7703	0.4077
→ .	10.0	00.0	53,11	591.7	5.921	0.687	-0.6550	0.0499	0.5255	0.5250		0.7757	0.4079
s	0.01	0.0	53.04	291.7	5,913	0.686	-0.0549	0.0498	0,5265	0.5276		0.7757	0.4084
•	0.01	0.00	52,92	592.7	5.900	→ 8 8 . 0	-0.0548	6.0497	0.5274	0.5269	0.3940	0.7805	0.4084
													•
							•						
							RODY	BODY AXES					
2	ALPHA	PHI	5		CLM	C	CLN	CLI		CAT	₹3	MCP/Lh	YCP/LM
-	0.0	00.0	0.2695			0.0176	0.0733				0.3522	0.5429	0.4918
2	20.0	0.00	8697.0			0.0176	0:0731				0.3522	0.5430	0.4938
~	79.0	0.01	0.2698			0.0176	0.0737				0.3524	0.5428	0.4895
❖	0.0	00.0				0.0177	0.0737					0,5430	0.4924
s	/0.0	0.01			0,7361	0,0177	0.0740					0.5432	0.4895
٥	6.67	00.0	0.2694			0.0176	0.0730			0,4020		6.5429	0.4947

CALSPAN AEDC DI VON KARI ARNOLD HOLLOMA PAGE 1	CALSPAN JRPGRATION AEDC DIVISIUN VUN KARMAN GAS UYNAMICS ARNOLD AIN FÜRCE STATION HÜLLOMAN KÜCKET SLED	JRECRATION JAS DYNA N GAS DYNA N FÜRCE ST	HICS FA	CALSPAN JREGRATION AEDC DIVISIUN VON KARMAN GAS DYNAMICS FACILITY ARNOLD AIN FÜRCE STATION, TEINESSEE HÜLLOMAN KOCKET SLED	بد					DATE TIME DATE TIME PROJE	DATE COMPUT. TIME COMPUTED DATE RECCROED TIME RECURDED PROJECT NUMBER	9-10E-89 10:22:39 0 1-MAY-67 0 3: 7: 2 ER VT-1A-37	2
RUN 20	Cube.	4.02	Fr 69.11	7T 590.7	5.014	P 0.443	T 139.6	RE 0.552E+07	A 7 8.289		KEF LENGTHS(CLM,CLL) 3.v90 2.200 2.200	5(CLM,CLW, 2,200 2	, CLL) 2, 200
1.3.	CONF1G 1.3.2.2.2.W16	•					1 KALP 0.025						
					;	-TUNNEL	CONDITI	TUNNEL CUNDITIONS, BASE	PRESSURES	RES			
2	ALPI	PHII	19	11	œ		CPBA	CABT	PBA/P	P81/P		PB3/P	P84/P
(0.01	10.0	69.11	550.7	5.014	0.443	-0.0390	0.0354	6.5587	0.5376		0.8927	0.3961
~ -		13°C	67°59	2.050	5,020	***	1557.00		090000	U.5383		00000000000000000000000000000000000000	1/65.0
n +	2 2	19.0	97.59	590.7	5.023		0680.0-	0.0354	0.5544	0.5360		0.8910	0.3969
S	200	0.01		590.7	5.000		-0.0390		0,5591	0.5391		0.8922	0.3972
•	4.01	0.01	64.87	590.7	4.996		-0.0390	0.0353	0.5591	0.5379		0.8927	0,3975
							RODY	AXES					
a -	ALPHA 0.03	PH1	CN 0,3094		CLM 0,7797	CY 0,0142	CLN	CLL 0 0024		CAT	CA 2443	NCP/LM	YCP/LH
7	0.0	00.0	0,3093		0.7793	0.0143	0.0602				0.1491	0.5753	0.4857
m	0.03	00.0	0.3094		7794	0,0143	0.0603				0.3491	0.5753	0.4855
*	0.03	0000	0,3095		0.7797	0,0143	0.0602				0.3491	0.5754	0.4863
S	0.03	0.01	0.3092		0.7794	0.0141	0.0593				9695.0	0.5752	0.4862
٥	60.0	00.0	0.3093		0.7806	0,0143	0.0501			0,3837	U.3484	0,5746	0.48BB